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THE BEST JOBS

Wow for e-commerce hiring! Woe to IT contractors! Our Hiring Survey reveals some startling results. Page 46

AT YOUR SERVICE

FedEx uses new service to seek customer input on improving its Web site. Page 36

COMPAQ'S PROSPECTS

Customers respect its engineering, but a *Computerworld* survey shows that they'll be buying less from Compaq. Page 64

COMPUTERWORLD

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APRIL 3, 2000 ▪ VOL. 34 ▪ NO. 14 ▪ $4/COPY

STORAGE RENTAL MARKET EMERGES

Provider model evolves to meet $8B demand

BY KATHLEEN OHLSON

First, application service providers roared onto the scene to ease users' software maintenance burdens. Now, service providers are moving into the storage arena, promising to rid users of their storage management headaches.

For a hefty monthly fee, storage service providers own, manage and operate storage infrastructures for their clients at remote data centers, similar to the way application service providers rent applications to customers. San Diego-based Centripetal Inc. will launch its storage service this month,

COMPUTER.COM'S Jordan Olin: Idea of an outsourcer watching over his data storage is a relief

joining Waltham, Mass.-based StorageNetworks Inc. in a market that's still in its infancy.

So far, storage service providers are drawing mostly small e-commerce companies

Storage Rental, page 14

JUDGE PUSHES FOR SETTLEMENT

Talks keep verdict in Microsoft case 'on ice'

BY PATRICK THIBODEAU

The moment of truth is at hand in the Microsoft Corp. antitrust case.

In what may be a sign of impatience, antitrust trial judge Thomas Penfield Jackson is said to want to see the parties reach a settlement by midweek. But he has already extended the deadline once and could do so again — if he becomes con-

Microsoft, page 16

AEROSPACE FIRMS TEAM FOR B-TO-B

Industry's conservatism could slow takeoff

BY JULIA KING, CRAIG STEDMAN AND JAMES COPE

Following the tailpipes of their counterparts in the automotive industry, four aerospace and defense giants last week unveiled an Internet-based trading exchange for the aerospace industry.

The partners planning to launch the electronic marketplace by midyear are The Boeing Co., Lockheed Martin Corp., Raytheon Co. and U.K.-based BAE Systems PLC. Together, the four companies annually procure $71 billion in goods and services from 37,000 suppliers.

Like the automotive exchange, the aerospace market-

Aerospace, page 91

NETDYNAMICS USERS CRY FOUL

Sun/Netscape benches application server; some users slam support, balk at migration

BY CAROL SLIWA

APP SERVERS

KeyCorp in Cleveland spent more than $10 million and three years building Web applications that rely on Sun Microsystems Inc.'s NetDynamics application server and development tools. So Senior Vice President Bob Dutile says he isn't happy that the Sun/Netscape Alliance elected to discontinue the NetDynamics product and base its forthcoming iPlanet Application Server on Netscape product code.

KeyCorp's applications won't run on the iPlanet software unless they're substantially revamped.

But what has made Dutile and some other big NetDynamics customers even more frustrated is the dearth of product information and the deterioration in support they say they have witnessed since Sun bought NetDynamics in July 1998. Sun joined forces to

NetDynamics, page 14

"WHEN PEOPLE ARE able to mold their jobs to fit them a little bit better, they stay," says career development expert James Waldroop

FURNALD/GRAY

SIGNS OF DEFECTION

THE DEPARTMENT AGITATOR TURNS APATHETIC. A programmer has a sudden need for long lunches and telephone privacy. The office slob discovers the sport coat. They're all signals that an IT employee is on the verge of bailing out. Our two stories identify the warning signs and offer advice from career development expert James Waldroop on how to keep your star performers.

Report begins on page 42.

NEWSPAPER

The old

rules

of business no longer apply

And neither do the old

operating systems

REID HORN

PLENTY OF CHORES ON THE SERVER FARM

Four case studies of centrally managed server farms demonstrate that managing them can be a much more complex task than running a mainframe data center ever was. But good IT people like Keith Pelphrey at Origin Technology in Business Inc. are making it work. Page 68

JOHN HARDING

DRIVING THE E-TRAIN

Business-to-business e-commerce is where the hot action is, and e-commerce networking pros like Commerce One Inc.'s Rupa Joshi are the folks who are making it happen. Page 76

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"THEY'RE ALMOST ALL A VARIATION ON 'MY BOSS IS A JERK.' THE JERK BOSSES WANT TO ASSUME IT'S ABOUT MONEY — BECAUSE THAT GETS THEM OFF THE HOOK.

JOHN PUTZIER, PRESIDENT OF HUMAN RESOURCES CONSULTANCY FIRSTEP INC., ON THE REASONS IT PEOPLE GIVE FOR LEAVING FOR ANOTHER JOB.

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30 JOHN GANTZ encourages IT leaders to brace themselves for the onslaught of digital marketplaces.

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'Wildfire' Finally Getting Started

Compaq's very late enterprise Alpha server is close to shipping at last

BY JAIKUMAR VIJAYAN

COMPAQ Computer Corp.'s long-delayed Wildfire enterprise Alpha server — originally due from Digital Equipment Corp. in mid-1998 — is finally close to shipping.

Compaq is planning a second-quarter launch of the 32-processor system, a company executive confirmed last week.

The first systems should become available in mid-May, with volume shipments expected in the second half of the year, according to a report that appeared in "Shannon Knows Compaq," a newsletter published by Terry C. Shannon in Ashland, Mass.

The new servers mark Compaq's first major high-end hardware technology upgrade since its acquisition of Digital nearly two years ago. The servers are the first upgrades to Digital's 14-processor Turbo-Laser systems, which debuted in 1995.

Wildfire systems, initially based on 729-MHz Alpha chips, can run both OpenVMS and Unix applications.

Each 32-processor Wildfire system can be partitioned into smaller virtual systems, which will allow administrators to take the load off multiple smaller servers and consolidate it on one large Wildfire box. Clustering technology will let them tie multiple Wildfire systems into one giant configuration, for increased scalability and reliability.

Such features — when combined with the raw number-crunching capabilities of the Alpha chip — should put Wildfire systems among the performance leaders in the technical computing market, said Carl Ludwig, a senior vice president at BlueSky Studios Inc. in New York.

LUDWIG: Wildfire's features may help make it a performance leader

The computer animation studio used Alpha servers in creating an Oscar-winning film last year. "The idea of using multiple processors and applying it to large rendering applications is something that interests us," Ludwig said.

Wildfire's support for very large main memory is also crucial, said Marshall Peterson, director of infrastructure at Celera Genomics Inc., a beta tester in Rockville, Md.

Celera, which uses Alpha servers for its gene sequencing work, recently placed an order for two Wildfire systems, after benchmarking them against systems from other vendors.

"Nothing came close to it.... They exceeded our expectation by a wide margin," Peterson said.

Wildfire should finally give Compaq the ammunition it needs to compete in the enterprise market against IBM, Sun Microsystems Inc. and Hewlett-Packard Co., said Joseph Pollizzi, deputy head of the Space Telescope Science Institute in Baltimore.

"Wildfire should stop them from being constantly compared to Dell instead of IBM," Pollizzi said. But he added that Compaq's success will largely depend on how the company markets the server. ◗

MORE THIS ISSUE

For results of a *Computerworld* survey on Compaq's future, **see page 64.**

Wireless Alliance Launched

BY BOB BREWIN

British Telecommunications PLC, AT&T Wireless Services Inc. and Microsoft Corp. plan to jointly conceive, develop and deploy new wireless applications around the world, building on alliances that already exist among the three companies.

The high-powered global collaboration announced in London last week will offer wireless services through Advance, a partnership that will allow customers to easily use cell phones anywhere in the world on next-generation, IP-based wireless networks.

Microsoft said it will dedicate a development team to creating the business and consumer mobile applications based on Microsoft's suite of mobile data software that will take advantage of existing and future high-speed wireless data networks.

For example, a Microsoft spokesman said, a field service technician could access illustrated manuals over his wireless phone and "view a video showing him how to do a repair."

The companies said they expect to begin trials of some of the services this fall. A commercial rollout is expected to take place soon afterward. ◗

ERP Vendors Admit They Can't Do It All

Some are reselling other vendors' apps

BY CRAIG STEDMAN

Suddenly, SAP AG and other top enterprise resource planning (ERP) vendors are deciding that they might not be able to develop complete integrated suites of business applications on their own after all.

Faced with stiff competition in a variety of new application areas, such as customer relationship management (CRM) and e-commerce, SAP and most of its ERP rivals are now looking for a little help from other software vendors.

For example, industry sources said last week that SAP is close to finalizing a deal to resell call center management software developed by Nortel Networks Corp.'s San Jose-based Clarify division. That would be a major change from SAP's usual insistence on writing its own applications.

But it would only be the latest in a flurry of similar announcements made by other ERP vendors such as PeopleSoft Inc. in Pleasanton, Calif., J. D. Edwards & Co. in Denver and Lawson Software Inc. in Minneapolis.

Meanwhile, Netherlands-based Baan Co. said last week that it's creating a separate CRM subsidiary. Company officials said the move sets the stage for a possible spin-off of that operation — just three years after Baan bought its way into the CRM business by acquiring Aurum Software Inc.

For some ERP users, the promise of a seamlessly integrated set of applications developed by a single vendor is a powerful magnet because it would free them from the need to integrate different products.

But Keith Bearden, CIO at dental equipment maker A-dec Inc. in Newberg, Ore., said the company has already given up on the idea of getting everything it needs from Baan.

More Than One Option

Baan's CRM software is too expensive for A-dec, Bearden said. And a product-data management application developed by the vendor was deemed too limited in functionality for a project that is currently on hold, he added.

Lockheed Martin Corp. in Bethesda, Md., uses SAP R/3 at several of its 17 business units and expects to eventually install the ERP system almost everywhere. The aerospace and defense manufacturer has also bought SAP's new data warehousing and supply-chain planning applications.

But Dick Beckman, an ERP program manager at Lockheed Martin, said there's no corporate edict to use SAP's applications. The business units make their own decisions, which results in a mix of applications at the company.

"From an implementation point of view, in an ideal world, everyone always thinks a one-vendor approach is the best way to go," Beckman said. "But of course, reality turns out to be something else."

And with more specialized software vendors enjoying big head starts in CRM and other areas, ERP vendors are starting to realize that they don't have time to build everything themselves, said Bruce Richardson, an analyst at AMR Research Inc. in Boston.

"By the time they try to get something developed, the market for it comes and goes," Richardson said. "There are too many other legitimate choices [for users]." ◗

For Resale

ERP vendors and the software developers they're relying on:

SAP: Expected to announce a deal to resell Clarify's call center software, possibly this week.

J. D. Edwards: Signed a deal in February to resell Siebel Systems Inc.'s full suite of CRM applications.

PeopleSoft: Said last week that it will use Commerce One Inc.'s trading-exchange software to build online marketplaces.

Lawson: Stopped its own CRM development two weeks ago and said it will resell Siebel's software.

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*According to "Internet Security Software: 1999 Worldwide Markets & Trends," by IDC.

AT DEADLINE

Cabletron Sells Unit

Cabletron Systems Inc. in Rochester, N.H., said last week that it would sell off the networking product group it purchased two years ago from Digital Equipment Corp. The sale includes the NetVantage line of LAN switches used by small businesses.

Science Systems Buys Coda From Baan

Baan Co. on Friday said it has completed the sale of its Coda accounting software unit to U.K.-based Science Systems PLC for $49.3 million in cash. The sale of Coda, which was announced two months ago, is part of the Netherlands-based Baan's effort to recover from six consecutive quarters of losses.

Net Tax Panel Votes

The fate of taxes on Internet sales remains muddy as the federal advisory commission that was set up to study the issue proved unable to send a unified recommendation to Congress last week. Needing a two-thirds majority vote for a recommendation, the Advisory Commission on Electronic Commerce, chaired by Virginia Gov. James Gilmore, split 10-8 on the official report of the committee.

Big Three, Others Join E-Business Forum

The nation's Big Three automakers, the Asian Development Bank and the Mayo Medical Center plan to join an electronic-business forum that's designed to streamline business-to-business travel connections. It's organized by the Lafayette Hill, Pa.-based Business Travel Coalition.

Microsoft Readies for 'Platforms Effort'

Microsoft Corp. last week said it's bringing together its Platforms and Developer Groups for a joint "platforms effort" for Microsoft's Next Generation Windows Services drive. The move is expected to be announced formally this spring.

Galileo to Revamp Its Global Travel Network

Will save up to $20M a year with IP WAN

BY JAMES COPE

GALILEO International Inc., which runs one of the biggest travel reservation systems, last week announced that it will replace its proprietary global network with an IP network built for speed and more predictable performance.

The IP network is expected to save Galileo $15 million to $20 million in annual operating costs over the legacy network, said Ron Thornhill, president and CEO of Quantitude Inc. Quantitude is a new wholly owned subsidiary of Galileo that will manage the network.

More for the Money

Thornhill, architect of the new wide-area network, said it was designed for optimum performance and reliability, a significant improvement over the patchwork legacy network and also cheaper to operate.

Rosemont, Ill.-based Galileo said the new network would serve 40,000 travel agents and 500 travel service providers worldwide.

Construction, which is scheduled to take place during the next three years, won't disrupt operations, Thornhill said. Network hubs are planned in 300 cities around the world and will employ network switches and routers from San Jose-based Cisco Systems Inc.

Quantitude said it is working on a deal with AT&T Corp. to help construct the network and to locate it's equipment in AT&T facilities. AT&T spokesman Mike Cuno said terms of the deal aren't complete.

RON THORNHILL: Galileo's new network will save millions

The parties wouldn't disclose the cost of building the new IP-based network.

Besides offering enhanced services to Galileo's customers, Quantitude will also offer data, voice and fax network services to corporate customers in its hub cities in 106 countries, Thornhill said.

David Endicott, vice president of rival Sabre Inc. in Fort Worth, Texas, said he had no comment on Galileo's announcement except that most travel reservation networks, including Sabre's, are moving to an IP-based infrastructure.

Other Galileo competitors include Amadeus Global Travel Distribution in Madrid and Worldspan Inc. in Atlanta.

MOREONLINE

For resources related to networking and the travel industry, visit our Web site.
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Hosted CRM Apps Due Soon

Early users happy to let others do work

BY CRAIG STEDMAN

Two application-hosting firms are about to release dueling sets of customer relationship management (CRM) software that they have pulled together from multiple vendors and integrated for users.

The rival CRM bundles that eConvergent Inc. and eLoyalty Corp. plan to announce this month could limit users' ability to choose individual applications that best fit their business needs.

But that's an acceptable trade-off for some early users who said they don't want to face the challenge of trying to piece together multiple CRM packages on their own.

For example, Cricket Communications Inc., a San Diego-based wireless phone company, is close to completing a deal to use eLoyalty's hosted CRM bundle to automate its call center operations.

The this-is-what-you-get nature of a preconfigured bundle "is always a concern, but I'm relying on them for their judgment in selecting those [applications]," said Phyllis Posner, vice president of customer operations and information technology at Cricket.

Posner wouldn't say how much time or money she expects to save by avoiding a do-it-yourself implementation. But she said Cricket should be able to get a CRM system up and running without having to hire consulting help or "a substantial IT staff of my own."

EConvergent, in Pleasanton, Calif., plans to announce its bundle this week. It's working with application vendors, including Octane Software Inc. and E.piphany Inc., both in San Mateo, Calif.

Chicago-based eLoyalty is due to announce its plans next week. The applications it's tying together include software developed by Clarify Inc., a San Jose-based division of Nortel Networks Corp. (see chart below).

Taste For Living Inc., a New York-based company that's due to launch a health and nutrition Web site in June, plans to use eConvergent's bundle to automate its customer-service operations.

Creating a CRM system from scratch "could have easily [meant] six to eight months of work," said Debra Langley, chief marketing officer at Taste For Living. "I'm not going to reinvent the wheel."

All Bundled Up

Hosted CRM packages from eLoyalty and eConvergent include the following:

- Multichannel interaction with customers via phone, e-mail, fax and Internet chat
- Customer self-service via interactive voice response and the Web
- Customer profiling and analysis tools
- Marketing automation and campaign management software (due later this year)
- Personalization technology (due later this year)

CA Continues Buying Spree

BY SAMI LAIS

Federal electronic-business specialist Applied Management Systems Inc. (AMSI) last week became the latest purchase in Computer Associates International Inc.'s shopping spree for companies that have a foothold in the federal government market.

Financial terms of the acquisition of Rockville, Md.-based AMSI, which is privately held, weren't disclosed, but all of the company's 100 service professionals will be joining CA, said a CA spokesman.

Last month, Islandia, N.Y.-based CA paid $4 billion for Sterling Software Inc., which holds substantial information technology implementation and services contracts with the federal government. The U.S. Department of Justice concluded its investigation of the merger last week.

AMSI produces personalized employee benefits statements for thousands of federal employees.

"Integration of AMSI's real-time employee benefits technologies with [portal and infrastructure technology from] CA and Sterling Software" will benefit users, said Michael Dortch, an analyst at Robert Frances Group Inc. in Westport, Conn.

For example, Dortch said, by combining technologies, including the capabilities of CA's neural net technology, the software "could warn employees when their benefits were going to expire or recommend benefit plan changes to a human resources director, based on changes in employee [data]."

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Cyber Patrol Case Tests Reverse-Engineered Apps

Injunction issued against sites that post 3 contested programs

BY ANN HARRISON

A FEDERAL RULING on a collection of programs that decoded Cyber Patrol filtering software is raising questions about the power of U.S. courts to force the removal of information from Web sites. The case could also have implications for the reverse-engineering of commercial software and attempts by companies to halt the practice, which they say damages the marketability of their products.

Abner Germanow, an Internet security analyst at International Data Corp. (IDC) in Framingham, Mass., predicted that the Internet community will find itself increasingly confronted by untested court rulings governing reverse-engineering and the freedom to post contested programs on the Web.

"This is the beginning of many similar issues that businesses will face — it sets a precedent," said Germanow.

The legal proceedings began last month when Mattel Inc. in El Segundo, Calif., parent company of Framingham, Mass.-based Cyber Patrol, filed a lawsuit in U.S. District Court in Massachusetts against the authors of the cphack, cndecode and cphl_rev programs. Those programs enable the re-creation of Cyber Patrol's list of blocked Web sites and newsgroups.

Copyright Charges

The suit claimed that authors Eddy Jansson of Sweden and Mathew Skala of Canada violated U.S. copyright laws.

"Our issue is not the list; the issue was the reverse-engineering and decompiling of software in violation of copyright and the posting [of] large sections of original source code and two executables derived from source code," said Sydney Rubin, a spokesman for Cyber Patrol.

On March 24, Mattel reached a settlement agreement with Jansson and Skala in which the authors agreed to turn over all rights to the software and an explanatory essay. Mattel then used its copyright to seek a court order against an estimated 50 mirror sites that linked to the contested software.

A week earlier, on March 17, U.S. District Court Judge Edward Harrington had granted Mattel a temporary restraining order against Jansson and Skala. Mattel sent notices of the restraining order to the mirror sites and requested that they remove the programs and turn over logs of people who had downloaded the banned software.

The American Civil Liberties Union, which represents three of the targeted Web site operators, fired back with a motion to suppress what it said were improper subpoenas. The ACLU argued that the software and links to the mirror sites represented constitutionally protected speech and that the "anonymity of persons accessing Internet Web sites should not be breached."

"We argued that the U.S. court doesn't have any authority to enter injunctions because the U.S. copyright laws don't apply overseas," said Chris Hansen, an ACLU staff attorney.

Rubin maintained that the injunction applies to mirror sites that post the program but not to those that post links to the mirror sites. IDC's Germanow said a ban on reverse-engineering would damage attempts to evaluate software for security holes and interoperability.

"If you restrict software to only being used in a way that the vendor intended, you risk stifling a lot of innovation," Germanow said.

Cphack appeared to be released under the Free Software Foundation's GNU General Public License (GPL), which could allow unlimited distribution of the program even if Mattel owns the copyright.

Jansson had attached the statement "Released under the GPL" to the cphack program because he wanted it to be freely available. But he said he never discussed releasing the entire package under GPL with Skala.

"Mattel got my rights to it," Jansson said in a statement. ◗

Court Action

Mattel/Cyber Patrol case time line:

MARCH 15
Mattel files lawsuit against cphack authors.

MARCH 17
District Court Judge Edward Harrington grants temporary restraining order against defendants.

MARCH 24
Mattel reaches a settlement. Authors agree to turn over "all rights" to cphack's source code, its binaries and an explanatory essay.

MARCH 28
Harrington issues a permanent injunction: Any Web site operator who is in "active concert" with cphack authors must remove program or face contempt charges.

Corrections

Due to errors in calculations and proofreading, a chart on information technology buying trends for this year that was published in the March 27 issue [page 83] misstated the most critical buying decisions IT managers say they face. The top two issues actually are security and wide-area network infrastructure. A correct version of the chart can be found on page 56.

Due to an editing error, a chart on page 62 of the March 6 issue misstated the results of a National Retail Federation/Forrester Research Inc. report on online shopping in January. The figures for the top 10 retail segments should specify millions, not billions. The total online retail spending in January was $2.8 billion.

Start-up Plans Personalization Services

ECustomers.com's tools will let businesses customize sites for visitors

BY DEWAYNE LEHMAN

Start-up eCustomers.com Inc. this week will begin offering centralized personalization services to enable e-commerce Web sites to immediately recognize visitors and customize pages accordingly, even if the shopper has never been to the particular site before.

The Austin, Texas-based company will sell its software along with access to a database of consumer profiles. The service, which will become generally available next month, will allow e-commerce sites to instantly recognize a visitor's profile, align it with product lines and customize the site accordingly, explained Jeff DeCoux, founder and CEO of eCustomers.com.

The consumer profiles begin as demographic and lifestyle "CyberClusters" that aren't personally identifiable. Site behavior during a visit is added to the profile, and other businesses using eCustomers.com will have access to the updated profiles, DeCoux said.

Company officials didn't specify pricing but said revenue would come from a combination of transaction fees, software and consulting services fees.

The data-sharing arrangement is unique, DeCoux said, because, starting in midsummer, customers will be able to log on to eCustomers.com and edit their profiles.

"This is the first system out there that gives consumers complete control of the data about them," DeCoux said. People can add more information about themselves, specify which companies to share data with or opt out, he said.

Boosting Purchase Rate

ECustomers.com is aiming to improve the low purchase rate among Web surfers. Only 2% of visitors to a site buy something, and only 5% buy again at that site, said Jamie Allen, vice president of development and operations at the company.

"What [marketers] haven't figured out is how to turn first-time visitors into buyers," said Richard Clayton, vice president of marketing at Angara E-Commerce Services Inc. in Mountain View, Calif., which plans to launch its own Web page personalization system next week.

Up-front personalization improves the chances that a visitor, generally pressed for time, will buy, said Jack Sansolo, executive vice president of global brand direction at Eddie Bauer Inc. in Redmond, Wash., and an eCustomers.com advisory board member.

He said his company will "more likely than not" use eCustomers.com to help expand its knowledge of its customers.

"We know everything about your purchase history at Eddie Bauer . . . but we don't know anything else about you," said Sansolo. "This allows us to learn more about you, if you choose to do so." ◗

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BRIEFS

EMC Tops in Management

EMC Corp. snagged the top spot from IBM's Tivoli Systems Inc. in the storage management software market, according to a Dataquest study. The Hopkinton, Mass.-based company totaled $763.5 million in 1999 licensing sales, followed by IBM/Tivoli with $725.6 million. Islandia, N.Y.-based Computer Associates International Inc. finished third with $690.1 million in 1999 sales.

GoShip Gets Going

Laguna Niguel, Calif.-based GoShip.com this week will launch a new service that allows online shoppers to compare and choose parcel shipping methods when buying goods from online retail sites. GoShip will offer its service to Web merchants under an application service provider model.

Web sites using the GoShip service will be able to offer their online customers a selection of carrier services and a choice of delivery time and cost.

Cyberattacks Double

The FBI said cyberattacks jumped from 547 cases in 1998 to 1,154 cases in 1999. However, the agency closed 399 of the cases in 1998 and 912 last year, according to FBI Director Louis Freeh in testimony before a Senate subcommittee. Disgruntled employees and hackers looking for thrills committed most of the attacks, but criminal groups and terrorist organizations are increasing their strikes, he said.

Survey: Linux Lacks Tools

Software developers are dissatisfied with the tools available for Linux, according to a survey of 300 people conducted by Evans Marketing Services in Santa Cruz, Calif., a division of American Science Corp. Compilers and editors for Linux were judged "adequate" by more than 75% of developers, but other tool categories, such as debuggers or modeling tools, were deemed adequate by only 10% to 50% of those surveyed.

Airborne Retools Dispatch System for E-Commerce

Freight company to equip 17,500 drivers with new Motorola scanners and radios

BY BOB BREWIN

Airborne Freight Corp. last week launched a major restructuring of its nationwide wireless dispatch system, equipping drivers with wireless scanners to provide the company's customers with the ability to track their shipments in real time, like competitors do.

Airborne, based in Seattle, currently dispatches its 17,500 drivers with an aging analog radio system. Drivers must use acoustic couplers connected to public telephones to upload proof-of-delivery information from bar-code scanners.

FDX Corp. in Memphis and United Parcel Service of America Inc. in Atlanta have equipped all their drivers with highly mobile digital terminals capable of operating inside buildings.

David Billings, Airborne's senior vice president of information and technology systems, said the company developed the wireless architecture to meet the time-sensitive requirements of e-commerce.

Real Time Essential

Jeff Kagan, a telecommunications industry analyst, called real-time tracking information essential to any company that wants to compete in the e-commerce world. "It's a cost of entry. Customers will not even consider a vendor that does not provide real-time tracking and accountability."

The new Airborne wireless architecture, approved by top management last week, calls for equipping drivers with new digital radios and bar-code scanners from Motorola Inc. in Schaumberg, Ill. The scanner will allow drivers to upload proof-of-delivery information at the time of delivery, said Tom Zywicki, director of systems development at Airborne.

Airborne also plans to shift its wireless network, which currently uses a pastiche of company-owned and leased circuits, to a new system leased from two nationwide carriers. According to Zywicki, Airborne is evaluating proposals from four bidders and expects to make a decision soon.

Zywicki said the company has tapped Bell South Wireless Data LP in Woodbridge, N.J., as an interim service provider in a number of key markets, including Seattle and the Washington, D.C., area. Bell South will provide airtime and equip drivers with between 5,000 and 6,000 RIM 950 terminals from Research In Motion (RIM) Inc. in Waterloo, Ontario.

AIRBORNE DRIVERS will get wireless scanners so customers can track their deliveries in real time

Airborne didn't disclose financial details of its new wireless architecture. But Zywicki did say the company is looking at "airtime costs of between $15 and $35 per driver, per month." That would put the annual airtime costs of the new network at between roughly $3 million and $7 million. ◗

Health Care Vendors to Launch Internet Exchange

Manufacturers to link purchasers with suppliers

BY JULEKHA DASH

Five major medical manufacturers have teamed up to form an Internet exchange that will link health care buyers with suppliers. But while such Web-based initiatives can help providers cut costs, the slow-moving health care industry may not be ready to get onboard.

The partners include Johnson & Johnson in New Brunswick, N.J.; GE Medical Systems in Milwaukee; Baxter International Inc. in Deerfield, Ill.; Abbott Laboratories in Abbott Park, Ill.; and Medtronic Inc. in Minneapolis. They plan to launch the exchange as a separate, privately held company that will be up and running by the third quarter.

Health care providers spend an average of $60 per non-Internet-based purchase order, according to Mark Anderson, an analyst at Stamford, Conn.-based Meta Group Inc. and a former hospital CIO. Conducting the purchasing transaction via the Internet could shave costs by at least $24 by reducing paperwork and automating processes, he estimated.

Hospitals could use the exchange to order medical supplies online, change their contract terms and check the status of their orders from a single online source. But buyers must still make contract agreements, including pricing, with the manufacturers themselves.

The biggest potential savings for health care providers switching to an Internet-based purchasing system may be time, said Anderson. While some health care providers today can send medical supply orders via electronic data interchange transactions, they have to follow up by phoning or faxing suppliers, he said.

By eliminating a lot of manual steps, providers conducting transactions on the Internet may be able to save 40% of the time it takes to complete a purchase order, Anderson said.

Arthur Collins, president of Medtronic, said he hoped the exchange would serve as a universal standard for purchasing online for the health care industry. But that may be a tall order, as the venture faces heavy competition from existing operations.

And establishing a standard means persuading buyers to change their way of doing business, which won't be easy, said Eric Brown, research director at Forrester Research Inc. in Cambridge, Mass. He predicted that exchanges will eventually experience some segmentation, as users gravitate toward specific exchanges because they cater to, say, large hospitals vs. small ones or handle certain types of medical supplies.

One of the exchange's competitors, Medibuy.com in San Diego, allows purchasers to select the best-priced product, said Anderson. However, that kind of service is aimed more at physician groups than at hospitals, which sign longer-term contracts, he said. ◗

JUST THE FACTS

Partners in Health Care

Web exchange will:

- Initially serve U.S. customers, then expand globally by 2001.
- Provide technology support from GE Global Exchange Services in Gaithersburg, Md.; i2 Technologies in Dallas; Ariba Inc. in Mountain View, Calif.; and IBM.
- Be based in Chicago. Each company will hold equal stakes in the firm. Financial terms were not disclosed.

Kaj Pedersen, VP of Engineering, **Quote.com**

"Reliability is key. In terms of stability and reliability, I've found the Windows and Compaq ProLiant environment to be significantly better than our Sun environment."

"Now that we've gone in this direction, we're also finding that our cost is substantially reduced."

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Novell Moves Directory Services Beyond the Firewall

BY DOMINIQUE DECKMYN

Novell Inc. raised the ante for directory services last week with its demonstration of new eDirectory features and products in hopes of turning the venerable NDS into an e-commerce platform.

At its annual Brainshare event in Salt Lake City, Novell outlined its Directory-Enabled Net Infrastructure Model, a vision of how the company intends to tie its offerings around the Novell Directory Services (NDS) eDirectory. In CEO Eric Schmidt's "one Net" vision (see interview, page 29), as outlined in his keynote speech, the directory provides organizations a way to bridge the gap between intranet and Internet, giving customers and business partners secure access to internal systems.

"I don't know how doable it is, but it makes a lot of our problems go away," said Patrick Pickens, a network engineer at Fluor Corp., a $12 billion global engineering services company in Aliso Viejo, Calif.

Michael Hoch, an analyst at Aberdeen Group Inc. in Boston, called the promises a "clever message," but said Novell will have to prove it can deliver. Toward that end, Novell previewed eDirectory-related technologies at Brainshare, most of them due in products by year's end (see chart).

Users raved about the Domain Name Server Federation feature that will be added to NDS this summer and will allow user rights to be assigned to groups from other companies. "We have billion-dollar deals where we work with customers for the length of the project," said Fred Leakeas, an information systems operations manager at Intermountain Gas Co. in Boise, Idaho. "You have to give these people access to your system."

Sessions on the coexistence of NDS with Microsoft Corp.'s Windows 2000 and Active Directory were popular at Brainshare. "I think it's wise of Novell to integrate with [Active Directory] rather than be a competitor," said Jim Sheats, a business systems adviser at Federal Express Corp. in Memphis. Novell currently ships its products on platforms including NetWare, Windows NT and 2000, Solaris and Linux.

Attendees found pluses and minuses in Novell's marketing after an overhaul of the department last year. "The work [Senior Vice President] Steve Adams is doing to unify the company's approach to marketing is impressive," said Hoch. But Huntington, N.Y.-based NetWare reseller Bruce Waring said Novell needs to communicate more with the general public. "We talk to our customers about Novell, but they go home at night and see 'Where do you want to go today?' on TV," said Waring. ◗

Pushing the Envelope

Novell technologies previewed at Brainshare for release later this year:

InstantMe: Instant messaging tool integrated with NDS; compatible with America Online Instant Messenger.

Single Sign-on 2.0: Extends single sign-on to any application.

Aquarium: Backs up files on Web server or storage appliance for accessibility from any location.

DirXML: Directory synchronization tool based on XML.

SSLizer: Appliance adds authentication and encryption to any Web site.

MOREONLINE

For resources such as articles and publications related to Novell, visit our Web site.
www.computerworld.com/more

Wells Fargo Abandons NetWare

BY DOMINIQUE DECKMYN

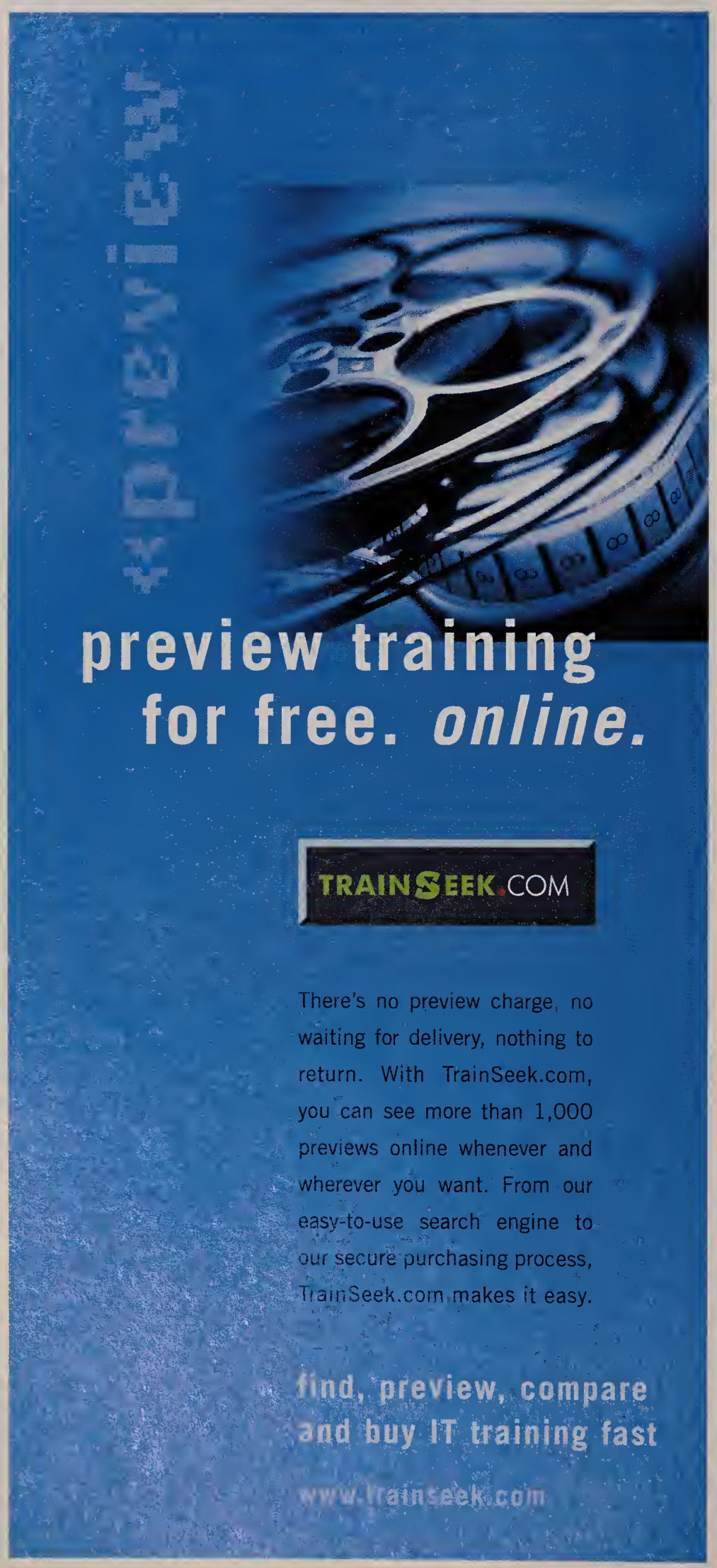
Wells Fargo & Co. in San Francisco is moving to Windows 2000. As a part of this process, it's abandoning NetWare and Novell Directory Services (NDS) in favor of Active Directory, a technology many analysts say is unproven.

"One of the reasons we stayed with Novell [NetWare 4.11] as long as we did was because NDS is a fine product," said Patrick Collins, vice president and engineering manager for Wells Fargo's Wholesale Banking Group. Collins' group will move its file and print services, e-mail and directory as well as 5,000 desktops to Windows 2000 by the end of the year. The company also has applications running on mainframes, several Unix systems and Windows NT. Some of these will move to Windows 2000 over time, Collins said.

"We just decided that, to simplify things, it made sense to go with Active Directory," said Collins. He said he believes it will be easier to create a single sign-on for users with Active Directory. "Too many passwords" is the biggest user complaint, said Collins.

But Charles Rutstein, an analyst at Forrester Research Inc. in Cambridge, Mass., said the bank's move was probably the result of intensive Microsoft wooing. "This is a tactic Microsoft has used for many years with large customers: not only offering a good deal on the software, but also making the transition very easy for them by throwing in consulting," said Rutstein. Collins confirmed that Microsoft offered free consulting in the overall agreement.

Rutstein said he believes that despite Wells Fargo's decision to migrate, coexistence between NDS and Active Directory will be the best approach for most enterprises. "While there is some additional pain in running two directories, there is also pain in ripping one out and in using an untested product," he said. ◗



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BRIEFS

Secure Web Reports

Actuate Corp. in San Francisco has announced Web content creation software that lets users extract data from any application and produce secure and customized reports for Web-based customers. It also announced an alliance with Allaire Corp. in Cambridge, Mass., to integrate the technology into Allaire's ColdFusion Web application server.

CA Serverless Backup

Islandia, N.Y.-based Computer Associates International Inc. introduced ARCserveIT, a serverless backup and recovery product for storage-area networks. ARCserveIT is said to enable backups from disk to tape without using any CPU or LAN bandwidth.

IBM SAN Investment

IBM last week announced it invested $400 million in new storage products and services. It launched a new Shark model with a 64-bit RISC processor, 16GB of cache and additional Peripheral Component Interconnect buses. IBM won't support peer-to-peer remote copying and native Fibre Channel connectivity until summer or early fall.

Embarcadero Upgrade

Embarcadero Technologies Inc. in San Francisco has announced ER/Studio 4.0, an upgrade to its modeling environment that offers advanced parser-based support for stored procedures and triggers and an automation interface for user customization. ER/Studio 4.0 users can create stored procedures and triggers in native database management system languages, or they can create template versions for drag-and-drop reuse.

Short Takes

In a $20 billion deal, SEAGATE TECHNOLOGY CORP. in Scotts Valley, Calif., last week returned to the private sector through an investor group and Veritas Software Corp. . . . Joel Manby, head of GENERAL MOTORS CORP.'S SAAB CARS USA operation, is leaving to become president of 6-month-old online car seller GREENLIGHT.COM.

New Bank's Net-Only Vision Bucks an Industry Trend

Touts online bill payments, wireless access and more

BY MARIA TROMBLY

AT A TIME when most Internet-only banks are looking for ways to add some physical bricks and mortar to their clicks, a new Internet bank — Claritybank.com — has no plans at all to expand its physical presence.

Claritybank, which opened its virtual doors last week, has only one physical location — what used to be the First National Bank of Uvalde, Texas.

It will remain a community bank but has been beefed up with a customer service center for online clients. It is a wholly owned subsidiary of Purchase, N.Y.-based Clarity Holdings Inc.

"We have no plans to grow physical locations," said Sheila Keegan, a company spokeswoman. "We feel very confident that the consumer who is using the Internet to bring ease and convenience to their life will also use it for their banking decisions."

To attract customers to a bank with no tellers, Keegan said, Claritybank.com promises the lowest rates in the country on single-family mortgages, the highest rates on one-year certificates of deposit and three-second credit-card approvals — in addition to free online bill payment, a discount brokerage and full wireless access through pagers, mobile phones or Palm handheld devices.

Business customers can also find staff, office supplies or equipment, she said.

Not Convinced

However, some analysts criticize Claritybank and other pure Internet plays for ignoring the bricks-and-mortar world.

"In the long run, you're going to need some kind of branch strategy," said Dana Stiffler, an analyst at Newton, Mass.-based Meridien Research Inc.

The most successful Internet banks give their customers a choice of channels, Stiffler said.

The sole Internet-only bank to make a profit with no physical branches is Alpharetta, Ga.-based Net.B@nk Inc., which has only 77,000 customers after four years in business, according to Richard Bell, an analyst at Needham, Mass.-based TowerGroup.

Behavioral Issues

"There are very, very deep-rooted behavioral issues in the way that people do banking," Bell said. "Thirty years after ATMs were introduced, roughly a third of all bank customers won't use them at all, and only one-third of ATM users will use them as a depository vehicle."

But there's room for Internet banks as a second bank, according to George Barto, an analyst at Gartner Group Inc. in Stamford, Conn.

"A pure-play Internet-only bank can survive and thrive, recognizing that it's not going to get all of its customers' business," said Barto.

Patent Office Plans Reforms Aimed Partly at E-Commerce

BY CHRISTINE McGEEVER
SAN FRANCISCO

The U.S. Patent and Trademark Office (PTO) last week announced plans to improve the quality of its much-criticized Web patent reviews and to virtually split from its parent agency, the U.S. Department of Commerce.

In a presentation to members of the San Francisco Intellectual Property Law Association here, PTO Director Q. Todd Dickinson said the agency will become a "performance-based organization."

That means the revenue-generating agency will act more like a business, with managerial flexibility and control over its budget, hiring and procurement.

However, Dickinson said, the agency still faces a budget crunch that won't improve this year. He said one-third of the PTO's $1.2 billion revenue from filing and processing fees currently gets appropriated to other agencies. "The practice is limiting our ability to hire examiners," he said. "The appropriation process negatively affects our work. The situation must be fixed."

A bill introduced in Congress last month might help. HR 4034, introduced by Rep. Howard Coble (R-N.C.) and already passed by one subcommittee, would let the PTO keep all the fees it collects.

Dickinson also outlined the PTO's plan for additional layers of review before granting patents for automated business methods. The PTO has been criticized for granting broad patents on e-commerce techniques such as Amazon.com Inc.'s 1-Click ordering process.

"Patenting of e-commerce technology has become controversial," acknowledged Dickinson. He added that the controversy centers on the perception that business methods can't be patented and that the PTO is understaffed and undereducated when it comes to high-tech issues.

Office Won't be Abolished

"No one is calling for abolition of the PTO," said Harris Miller, president of the Information Technology Association of America, a trade group in Arlington, Va. But he said the patent review process is flawed and has yielded "fairly significant cases" of questionable patents.

Gregory Aharonian, the publisher of the "PatNews" electronic newsletter and a critic of the PTO, called Dickinson's plan "a farce."

In order to function as a business, Aharonian said, the PTO would first need competition, which it doesn't have. Second, it would need to be able to accurately gauge customer satisfaction.

Although the PTO regularly cites surveys showing high satisfaction among patent applicants, Aharonian said the PTO's true customer base is businesses and individuals who must compete with patent holders.

Pamela Banner, a Washington patent lawyer, said the changes in the patent process are "generally a good thing. They aren't earth-shattering, but they add more review, which is good."

She said the prospect of the PTO getting to keep all its fees is an essential element of reform. "This siphoning of funds is ridiculous," she said.

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Continued from page 1

NetDynamics

co-develop software with Netscape Communications Corp. later that year. (The company has started calling itself iPlanet E-Commerce Solutions.)

"They didn't keep us in the loop at all on where they were going with their products," said Mike Anderson, vice president of information systems at The Home Depot Inc. in Atlanta. "Nobody knows what they're doing. It's almost like a little secret society, and it ticks me off."

Home Depot used NetDynamics to develop and deploy applications for vendor service, field reporting and information systems time tracking. But because Anderson couldn't get solid answers from Sun on product plans last spring, he told his developers to build their own servlet-based architecture.

Unanswered Questions

Anderson said he will probably try iPlanet, testing the conversion routine that he has been told will help move NetDynamics code to the iPlanet programming model. But it remains to be seen if code that had been fine-tuned for NetDynamics will work just as well with iPlanet. "If it takes effort and I have to do a lot of rewriting, I will probably take those applications and keep the functionality the same but rewrite them in our homegrown [system]," he said.

KeyCorp, which has about 100 NetDynamics development licenses, planned to migrate to the latest and final edition of NetDynamics. Instead, the bank started evaluating other application servers earlier this year, after spending three months trying to get answers on why core components were dropping off-line or slowing down. IPlanet is "just another candidate now," Dutile said.

"Sun was definitely one of our top vendors last year," Dutile said. "That obviously now is called into question."

That doesn't surprise Daryl Plummer, an analyst at Gartner Group Inc. in Stamford, Conn. He said he has spoken with clients who are looking at other products. "I know [iPlanet] has lost some customers and not gained customers they could have gained."

Sanjay Sarathy, iPlanet's director of application server marketing, said iPlanet logged some 50 new customers this quarter and counts NetDynamics customers in the beta program for iPlanet 6.0, which is due to ship next month.

"If customers are complaining, we're certainly going to listen to those complaints and do what we need to do to make them happy," Sarathy said.

Not every customer is unhappy. Steven Durflinger at Excelergy Corp. in Santa Monica, Calif., said an outside company spent two weeks at his firm "on the alliance's dime" to determine what needs to be done to convert NetDynamics applications. "We were one of the test-case customers," said Durflinger, who has spoken at Sun events in the past. "The answers I have been given make me feel it's worth sticking" with iPlanet, he added. "There will be some rewrite involved, but it will be less painful than writing from scratch."

To varying degrees, early adopters of any vendor's application server will pay some price for having adopted the cutting-edge technology before it reached a mature state. They built applications to their vendors' proprietary models. Now they face migration work as vendors move to a common programming model — Sun's Java 2 Platform Enterprise Edition (J2EE).

But NetDynamics users could feel more pain, because the code base for their product isn't being carried forward to the new iPlanet server.

Last May, Sun and Netscape announced that they would combine the best of their application servers. But in July, they said the newly branded iPlanet product would be based on Network Application Support code, because it was further along in supporting the important J2EE improvements that customers wanted.

"To actually take two code bases and 'munge' them together would have been too difficult," Sarathy said.

"Each tactical decision that Sun has made seemed to be the right one at the time," said Carl Zetie, an analyst at Giga Information Group Inc. in Cambridge, Mass. "But the end result has been to leave many NetDynamics customers in the cold." ◗

AT A GLANCE

Server History

Sun/Netscape application server:

July 1, 1998: Sun buys NetDynamics Inc.

Nov. 24, 1998: Netscape, Sun Microsystems deal to jointly develop and market e-commerce products announced

March 17, 1999: AOL acquires Netscape

July 1999: Sun-Netscape Alliance rebrands products as "iPlanet"

May 2000: iPlanet Application Server 6.0 expected to ship

Users: Support Already Suffering

The NetDynamics application server may be supported through the Sun/Netscape iPlanet E-Commerce Solutions organization through 2002, but some customers said they're already having trouble getting assistance.

One major retailer, for example, was told it would have to wait a week for help when its Web application went up and down after receiving a high volume of hits the day after Thanksgiving, according to the retailer's former CIO.

Mat Stickler, director of information technology at the natural gas subsidiary of PG&E Corp., complained that support has waned for NetDynamics on Hewlett-Packard Co.'s Unix platform. He said his salesman often doesn't call back, and support staffers sometimes suggest that he switch to Sun Solaris, "which we didn't find all that helpful, since we had over a half-million dollars invested in HP-UX."

"The bottom line is, NetDynamics is dead. I'm going to have to switch," said Stickler, whose company spent $650,000 on its NetDynamics Web application. "And I'm having a hard time bringing myself to go with iPlanet, just because of the way I've been treated."

The Home Depot's Mike Anderson, vice president of IS, said he had also gotten the Solaris suggestion, which did not sit well with him because he has already invested $150,000 in HP servers.When he couldn't get a timely resolution to one problem, he said, he finally called Sun President Ed Zander.

Each one of the users said they received better support from NetDynamics prior to the Sun acquisition and the formation of the Sun/Netscape Alliance.

Sanjay Sarathy, iPlanet's director of application server marketing, wouldn't comment on specific instances of problems. But he said support has always been and will continue to be a top priority and that support resources actually have increased. He couldn't provide specific figures on those increases. – *Carol Sliwa*

Continued from page 1

Storage Rental

as customers, because venture capitalists would rather have dot-coms turn a profit or invest in strategic initiatives than create in-house storage infrastructures, said Adam Couture, an analyst at Dataquest in Lowell, Mass.

Dataquest predicts that the storage service provider (SSP) market will explode from $10 million last year to $8 billion in 2003. But analysts said it will still be a challenge for SSPs to move beyond dot-coms and gain the trust of larger corporations that have their own technology infrastructure.

One issue is that the vendors offering this service don't have track records, said Jim Porter, an analyst at Disk/Trend Inc. in Mountain View, Calif. "They don't know if they'll be around in two or three years. . . . God knows what happens to the data" if the vendor goes out of business, he said.

Jerry Lynch, director of operations at the Online Computer Library Center in Dublin, Ohio, said he's "fascinated" by SSPs but needs site security guarantees, uninterruptible power-supply protection and "enough of the right names" involved.

Some heavyweight vendors are dipping into the SSP arena. Storage Technology Corp. in Louisville, Colo., last week, with Great Hill Partners LLC, launched Managed Storage International, a separate firm that will offer data storage services such as storage-on-demand and server and PC backup.

But the overall lack of experienced SSPs has left some users nixing the idea.

Brian Dunnam, director of systems engineering at DotPlanet.com Inc. in Duluth, Ga., entered into contracts with two SSPs, which he declined to name, canceling one contract and not extending the other.

"We have a very dynamic environment that changes on a moment's notice," so the SSPs had a difficult time managing the storage environment, Dunnam said. The Web-hosting firm now manages its storage in-house.

But other customers said they like turning over their storage management woes to someone else.

Jordan Olin, chief technology officer at Maynard, Mass.-based Computer.com, moved the company's storage to StorageNetworks in preparation for this year's Super Bowl ad campaign. The online retailer stores member information, commerce transactions and logs at a StorageNetworks data center in Waltham, Mass.

But using an SSP is pricey. Olin said Computer.com pays 20% to 40% more per month than when its storage was in-house. According to StorageNetworks, the average monthly cost for managed storage per terabyte is $50,000. Computer.com now has 200GB of physically mirrored storage.

Yet Olin said the idea of a company watching over his data storage is a relief. Before, "we didn't run fast equipment, and we didn't have an expansive storage infrastructure. [Now] we don't have any hassles to manage it," he said.

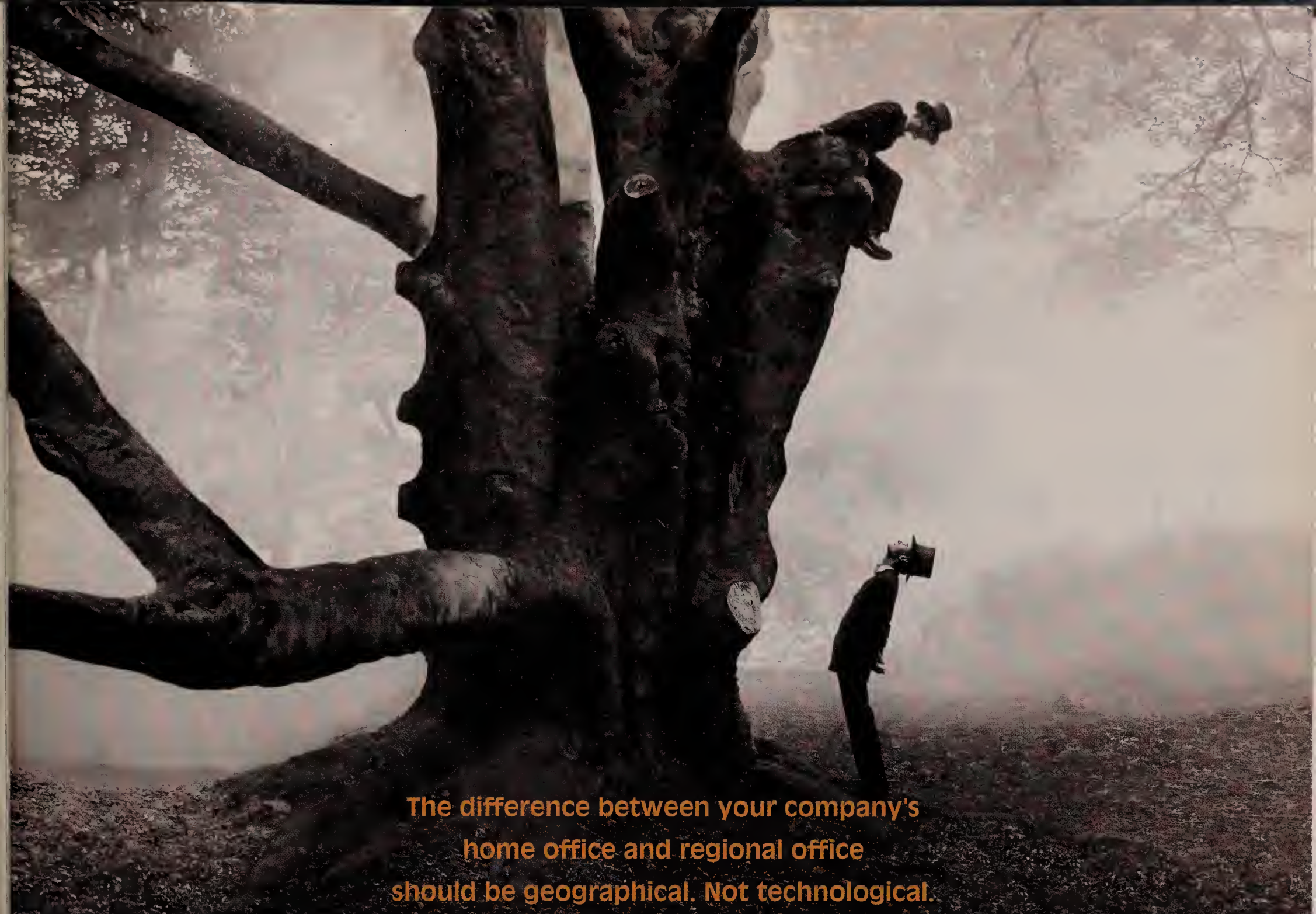
Eventually, large corporations may be forced to turn to SSPs because of problems with staffing, scalability and management costs for storage, said analyst Michael Peterson, president of Santa Barbara, Calif.-based Strategic Research Corp. "[Corporations] may be leery, but they'll have no choice" if these trends continue, he said. ◗

$8B Worth of SSP

Sales for storage service provider market:

1999	$10M
2003 (estimated)	$8B

SOURCE: DATAQUEST, SAN JOSE, CALIF.



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MasterCard, Visa Vie For Wireless Victory

MasterCard claims lead in wireless e-commerce; Visa says standards needed

BY BOB BREWIN

MASTERCARD International Inc. last week asserted that it has taken the lead over rival Visa International Inc. in the race to turn wireless e-commerce into a reality.

Both companies have spent the past six months signing alliances with key wireless software and hardware vendors, in anticipation of a new world in which consumers use "digital wallets" to make payments online or at stores.

The digital wallets, which come in the form of either server-based software or chips embedded in smart cards or handheld devices, allow consumers to pay for online purchases easily.

Art Kranzley, a senior vice president at MasterCard in Purchase, N.Y., touted the company's agreement last week with Toronto-based 724 Solutions Inc. — which has developed highly secure mobile payment software — as a sign that MasterCard has "taken the lead" in payment services for wireless customers.

But Margaret Reid, vice president of multifunction platforms at Foster City, Calif.-based Visa, countered that it's too early to declare a victor.

She said the focus should be on practical issues that are of paramount concern to consumers and merchants, not on capturing a technology lead. The consumer has no desire to tote around multiple methods of electronic payment, nor does the merchant want to install a variety of a systems, Reid said.

That means standards, not technology, will rule the day. "We're a great proponent of standards and have worked in the past with MasterCard. ... But in wireless, it is almost too early, as there are competing organizations with different standards. Ultimately, one or two of those standards will work out," Reid said.

Continued from page 1

Microsoft

vinced that both sides are making progress, said one source close to the case. But he won't let talks go on forever.

The judge's verdict is "on ice" and ready to be delivered, and there's little doubt he will rule against Microsoft, say sources. If no settlement is reached, it will take two or three years before the appeals process is exhausted. But a settlement could bring immediate changes that could be both a blessing and a curse, said corporate users and analysts.

Both sides have been meeting in Chicago with a court-appointed mediator and have reason to settle. Microsoft otherwise risks that the judge's verdict will be used against it by private litigants. For the government, no settlement means the remedies it seeks may be delayed for at least two years or more — a distant future in technology.

An out-of-court settlement is expected to require Microsoft to guarantee exposure of its operating system application programming interfaces (API), which are the links that let applications work with the operating system, along with opening some of the Windows source code so third-party developers have access to the underlying Windows technology.

"The only thing that is really going to help any developer is if they open up the operating system," said Bill Fitts, director of application development at Continuum Health Partners Inc. in New York.

With an open Windows source code, developers would have new options to improve performance of applications on operating systems, said Fitts. "Third-party software will get better," he said.

But if developers change operating system source code to customize their applications, it could create system conflicts, according to Alan Sauerbrei, information systems manager at Wright Brand Foods Inc., a food processor and distributor in Vernon, Texas. "One vendor makes a slight change, and it clobbers another vendor's software," he said.

And ensuring that the APIs aren't used by Microsoft to the disadvantage of third-party developers won't change the fact that applications drive the choice of operating system, said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass.

Microsoft applications, especially its word processor and spreadsheet, which have more than 90% of the revenue in those markets, were designed to work with one another and are linked to specific features on the Windows NT and 2000 servers, he said.

Microsoft Case

An out-of-court settlement is possible. The judge is giving both sides until the middle of next week to attempt to reach a remedy.

Why it's been hard to reach a settlement: Key problem is preventing Microsoft from killing off new companies and technologies in much the same way its attack on Netscape crippled it.

- **How do you do that?** Settlement must include restrictions on what Microsoft can and cannot include in its operating system. Microsoft is unlikely to agree to anything that hurts its "ability to innovate."

Why the government should settle: The government is expected to win big with Judge Jackson, but the appeals court could reverse that.

Why Microsoft should settle: A verdict that establishes that Microsoft is a monopoly and says it has violated the law in order to preserve that monopoly increases Microsoft's legal liability toward other parties that believe they have been harmed by the company's monopoly. The lawsuit is also a major distraction for company executives and employees and has been affecting its stock price of late.

Next steps: The judge is deciding this case in three parts:

- **First:** Findings of fact.
- **Next:** The verdict or conclusions of law.
- **Last:** The remedies; Jackson's verdict won't include remedies.

Possible remedies:

- **Conduct:** Would impose restrictions on Microsoft's behavior. The company would not be broken up.
- **Structural or breakup:** Some believe Microsoft should be split along application lines – the productivity applications and tools would be separated from the operating system. Another proposal would involve splitting Microsoft into three separate operating system companies. The new companies would compete with one another on price and features.

Breakup Pros and Cons

A settlement in the Microsoft case that doesn't break up the company has always been possible — but isn't likely. The toughest problem in crafting any settlement is preventing Microsoft from doing to other companies what it did to the former Netscape Communications Corp., said legal experts.

"Clearly, the browser is a prime example of a tactic that Microsoft has used [to attack Netscape], and I'm confident the government would not settle a case unless there were some way to resolve issues like this in the future," said Stephen D. Houck, the former lead trial counsel for 19 states who is now in private practice at Reboul, MacMurray, Hewitt, Maynard & Kristol in New York.

Many of the government's legal claims against Microsoft and the issues that may form the basis for a settlement stem from the company's treatment of Netscape. The government has argued that Microsoft delayed giving Netscape access to Windows 95 technical information, which hurt Netscape's ability to quickly release a browser for that new system. It has also argued that Microsoft used its operating system pricing power to discourage PC makers from including Netscape on their desktop systems.

The most difficult issue negotiators may be facing is addressing the claim that Microsoft "tied" the browser to the operating system with the intent of crushing Netscape, experts said. The government could seek restrictions on Microsoft's ability to integrate applications with the operating system.

"Presumably, Microsoft wouldn't be able to integrate these applications without making them easily removable, akin to Velcro," said Hillard Sterling, an attorney at Gordon & Glickson PC in Chicago.

Critics are doubtful the government will accept any Microsoft proposal. "You [have] got to be [suspicious] when the defendant in a law enforcement action proposes his own punishment," said Ken Wasch, president of the Software and Information Industry Association in Washington, which has argued for a breakup.

But Stanley Liebowitz, an economics professor at the University of Texas at Austin and an opponent of the government's case, said Jackson runs clear risks with a breakup and that may be why he is pushing for a settlement. "He doesn't understand this market that well, and he knows it," he said.

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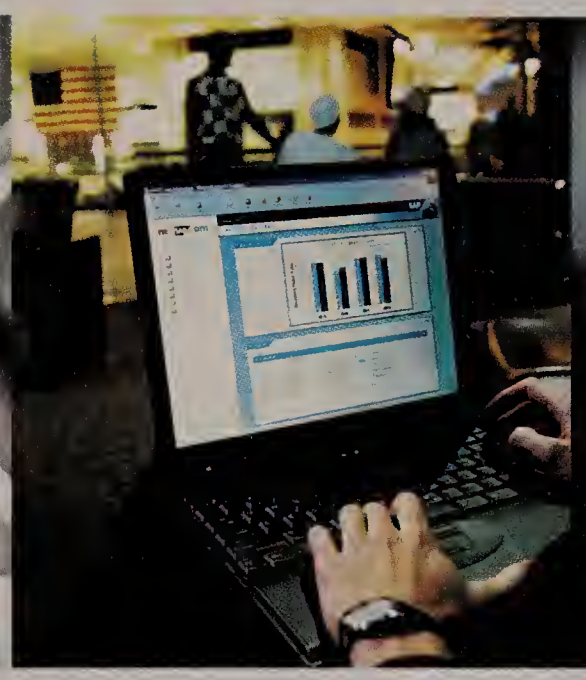

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Supplier Network to Ease Access to Online Exchanges

Package designed to let users into multiple markets

BY JULIA KING

IRONSIDE TECHNOLOGIES INC. in Pleasanton, Calif., today announced software and services designed to offer suppliers plug-and-play, real-time data integration with multiple online exchanges. The Ironside Network is significant because it gives suppliers a way to quickly enter and exit online marketplaces without creating separate back-end links to each exchange.

Ironside provides basic plumbing, via the XML content-tagging language, that lets suppliers upload real-time data from their enterprise systems to various online exchanges — regardless of the commerce protocols used by a particular exchange or the enterprise software at the user company.

The Ironside Network initially will support exchanges using XML-based protocols from Mountain View, Calif.-based Ariba Inc. and Walnut Creek, Calif.-based Commerce One Inc. It will eventually also support exchanges running on software from Moai Technologies Inc., Intellisys Electronic Commerce LLC and RightWorks Corp.

"Ironside provides a very convenient on-ramp for suppliers," said Albert Pang, an analyst at International Data Corp. (IDC) in Framingham, Mass.

This is especially important for suppliers such as Weidmuller Inc. in Richmond, Va., which sells to customers across several industries.

"We deal with electrical distribution and electronic distribution. The two businesses are entirely different, so we'll be on more than one exchange," said Frederik Wenzel, chief financial officer at Weidmuller.

Rick Holden, president of J. L. Hammett Co., a $200 million school supplies company in Braintree, Mass., said he also expects to be trading on more than one online exchange.

But Holden said he can know for sure which exchanges yield the greatest benefit only by actually trading on them. As a result, "I need the ability to plug in and unplug quickly," Holden said.

The Ironside Network is free for any supplier running the company's Ironworks 4.0 product suite. Other suppliers can link into the network for a setup fee of $25,000. After connecting, all users pay a monthly fee of $500 plus $1 per transaction. Ironside said the typical implementation time is 20 days to integrate any manufacturer, distributor or other supplier into the Ironside Network, giving a company access to an unlimited number of online exchanges.

Pang pegged the current number of online exchanges at about 350. By next year, however, IDC forecasts that that number will grow to more than 2,000.

According to Forrester Research Inc. in Cambridge, Mass., companies that use exchanges now trade about $19 million in goods and services on one to two online exchanges. But by the end of next year, the average company will trade about $49 million in goods over four exchanges, Forrester says. ◗

JUST THE FACTS

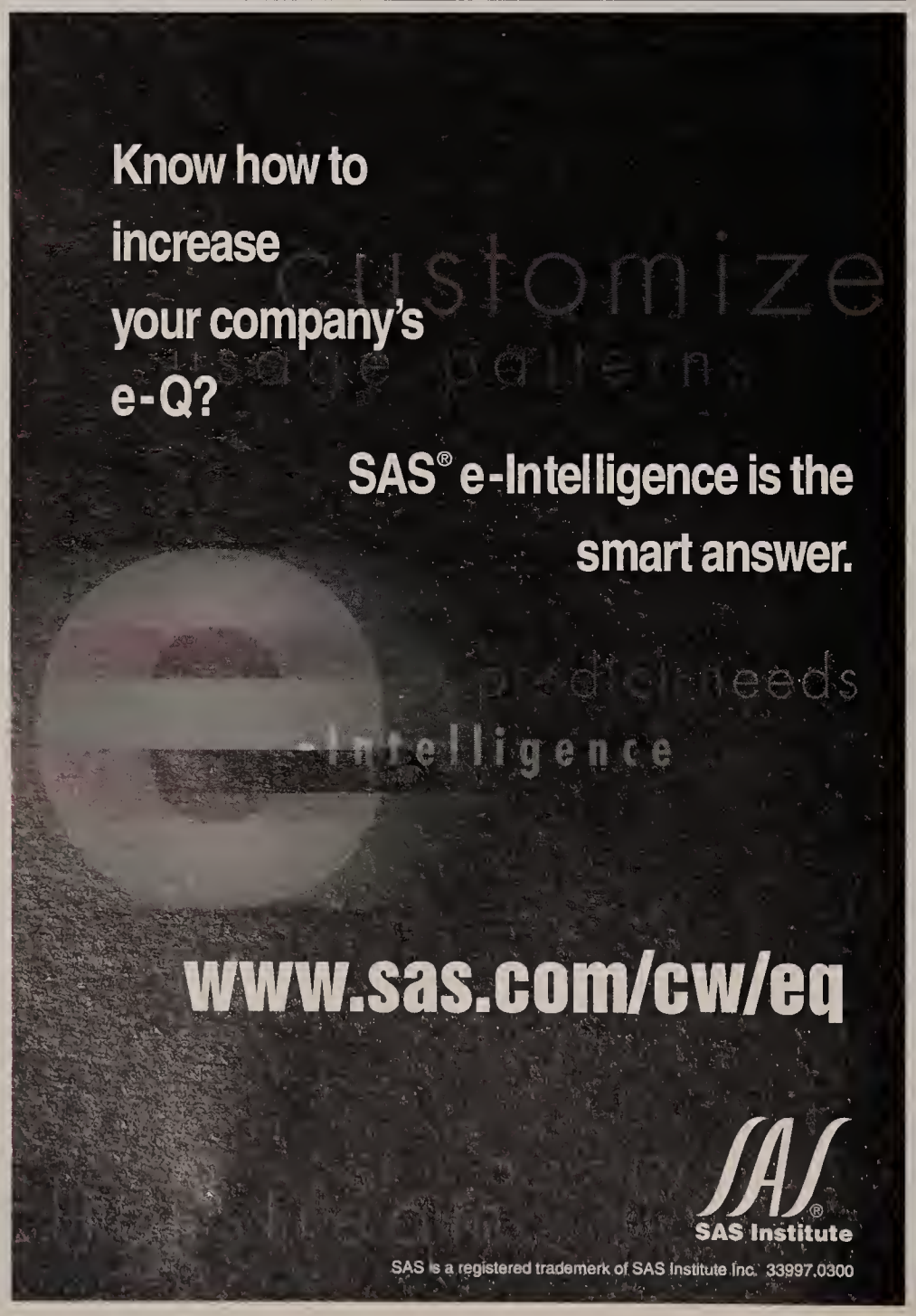
Ironside Network

What it does: Integrates suppliers with multiple exchanges in real time via a single entry point

How long to implement: 20 days

How much: $25,000 setup fee for new users

- Free connection for current users
- Subscription fee of $500 per month
- $1 per transaction



Private Sector Is Envy of Fed CIOs

Government IT leaders aren't always in the loop

BY PATRICK THIBODEAU
WASHINGTON

Unlike their private-sector counterparts, federal CIOs often lack access to top management and may be treated primarily as technical support managers. It's a disparity that's worrying some federal officials, especially as information technology projects and good information security practices become increasingly critical to an agency's success.

Some private-sector CIOs last week urged Congress to improve the status of federal CIOs.

"Empower the CIOs in the federal government to effect and motivate change, as we have been empowered in private industry," urged Suzanne Krupa, CIO at Rowe Cos., a Salem, Va.-based home furnishings company.

In a report last week, the U.S. General Accounting Office (GAO) said the key to improving federal IT projects may lie in giving federal CIOs the same kind of power and recognition that their private-sector counterparts have.

"There is a disparity from agency to agency in the organizational placement and authority of the CIO," said Jim Flyzik, CIO at the U.S. Treasury Department. Flyzik recently testified before a House subcommittee examining the issue.

"Private-sector CIOs can work directly with the CEOs to make immediate decisions," said Flyzik. "Public-sector CIOs must plan well in advance and work through various layers of government to achieve such change."

The House subcommittee on government management, information and technology, which held the hearing, was told by CIOs from both the public and private sectors that CIOs need to be recognized by top executives in order to be effective.

But in its report on CIO management practices, the GAO found that many CIOs at federal agencies aren't included in the executive decision-making process. Moreover, information management is still often treated as a technical support function rather than a strategic asset, said David McClure, a GAO associate director.

Federal CIOs also face unique challenges. The CIO may be dealing with a political appointee who serves as an agency head and isn't focused on IT issues. Budget and personnel policies, including pay rates that are lower than those in private industry, can also constrain IT managers, said McClure. ◗

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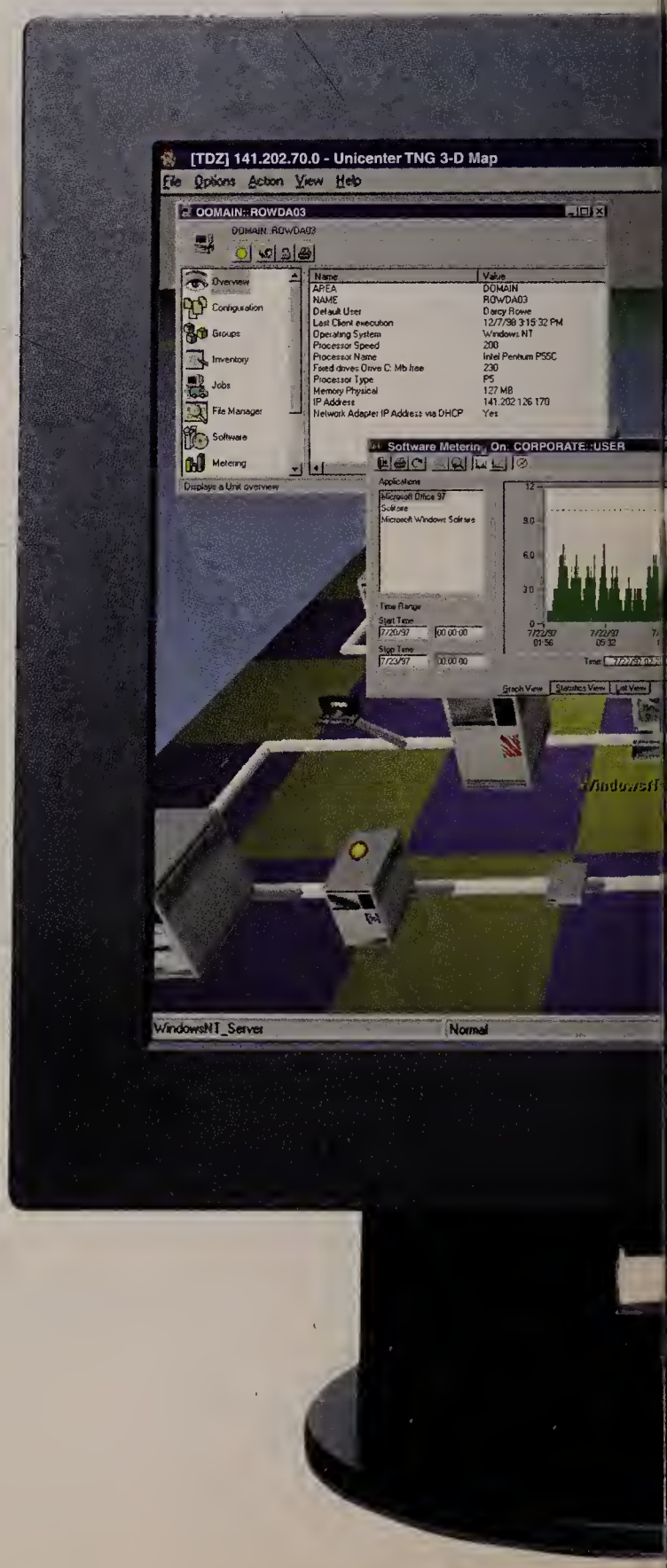

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Railroads Hot for Satellite Monitoring

But analysts, customers question need for a system that could cost millions of dollars

BY LINDA ROSENCRANCE

CSX Transportation Inc. has equipped 300 locomotives with a Global Positioning System (GPS) and will have 2,800 more online by October.

Union Pacific Railroad (UP) in Omaha is experimenting with satellite-based monitoring systems, too. It installed devices on 100 of its 155,308 freight cars last summer.

"The future of [car tracking] in the rail industry is GPS," said Dave Wheeler, a systems vice president at Union Pacific.

But others in the railroad industry beg to differ: They say GPS is unnecessary and a waste of money because the industry already uses the land-based Automatic Equipment Identification (AEI) system to monitor the whereabouts of equipment. Nonetheless, GPS may one day replace AEI.

With AEI, railcars and locomotives have tags that send information to the railroads as the tags pass AEI readers, which are usually placed at major intersections.

Many vendors offer GPS systems. Jacksonville, Fla.-based CSX uses the Pinpoint Locomotive Tracking System from GE Harris Railway Electronics LLC in Melbourne, Fla.

MICHAEL ERENBERG: CSX plans to expand its use of GPS

Pinpoint consists of an onboard computer, satellite transceiver, locomotive interface electronics and a power system in the cab. To support this system, an antenna is installed on the roof of the locomotive. Location and fuel data transmitted by the locomotives is reformatted at the GE Harris data center and delivered to CSX's data center.

Pinpoint allows the railroad to know the location — within approximately 110 yards — of a locomotive, according to Orbcomm Global LP in Dulles, Va., the satellite communications provider for the system.

Finding Wayward Trains

Michael Erenberg, assistant vice president of locomotive operations at CSX, said the system — which is programmed to send alerts to locomotive managers hourly — also quickly identifies locomotives that have left their routes.

Union Pacific uses a system called Health Track from StarTrak LLC in Morris Plains, N.J. Monitoring sensors are placed on some freight cars — two-thirds of which carry automobiles — to detect potentially damaging events such as theft or break-ins. The system sends the information via satellite to the railroad operating manager, private car owner or shipper. The satellite link provides interactive communication, allowing the owner or operator of a railcar to ask about location, load status and performance via the Internet or UP's internal systems.

But critics abound.

Paul Neville, vice president of Railinc Corp. in Cary, N.C., said GPS technology is redundant and isn't worth the expense because of AEI. Railinc provides an electronic data interchange network and worldwide database for the rail industry.

"While GPS is a good idea, the railroads would have to equip all their cars with transmitters, at about $1,200 a car," Neville said. "With about 1.5 million railcars, it would cost hundreds of millions of dollars. The railroads would have to be presented with a strong business plan if they [are to be convinced to replace the AEI] system that is only 10 years old."

Donald Broughton, a transportation analyst at A. G. Edwards & Sons Inc. in St. Louis, said GPS is good technology in theory, but it doesn't live up to its potential in practice.

"It's not financially viable for the railroads to do this," Broughton said. "First, they're already accomplishing what they want to accomplish [by using AEI technology]. And second, the GPS technology available to civilians can't accurately pinpoint the location of [a railcar or locomotive]." Civilian GPS, which uses a different signal than than military GPS, is accurate to within 110 yards. It's expected to be accurate to within 3 feet by 2003 (see related stories, this page).

Railroad customers have mixed opinions about the use of GPS to track trains.

Scott McCalla, supervisor of rail fleet operations at Omya Inc., a calcium carbonate producer and shipper in Proctor, Vt., said it would be a mistake and expensive to install GPS technology on railcars.

"The railroads already have a system in place that is underutilized," McCalla said, referring to AEI. "The problem is there are only so many readers out there, and short-line railroads, like our local railroad, don't use [the system]. And not even large railroads use [AEI technology] as much as they should."

But Chris Fernandez, logistics manager at Charlotte, N.C.-based KoSa Chemical, said installing GPS technology throughout the rail industry is a "matter of priority."

"Everyone is trying to track where their product is at any given time," he said.

Keeping an Eye on the Goods

From the customer's perspective, GPS is cost-effective because it lets them know where their goods are, Fernandez said. However, he added, it's better for the technology to be on cars rather than locomotives, because cars get separated from locomotives.

Erenberg disagreed, saying that if a company knows where the locomotive is, it knows the location of each car.

Erenberg said CSX is using a combination of GPS and AEI tags and readers to monitor its fleet, but plans to expand its use of GPS in the future.

Other railroads — including Burlington Northern Santa Fe Corp. in Fort Worth, Texas, Norfolk Southern Corp. in Norfolk, Va., and the Canadian National Railway Co. in Montreal — are working with the Federal Railroad Administration to implement a system that would more effectively control train systems to prevent accidents, as well as reduce delays and increase running time reliability. That system uses several technologies, including GPS and fiber optics.

Still, some say GPS will eventually become the standard, even if its usage is somewhat sporadic now.

"Down the road, GPS will probably replace AEI technology, even though it's quite a capital investment," said UP's Wheeler.

Will GPS Technology Help Railroads?

Pros:

- Pinpoints location of locomotives within 110 yards
- Improves efficiency by decreasing idle time, time spent off course and the time it takes to get in to and out of terminals
- Provides real-time data on load status, operating performance, fuel level

Cons:

- It's expensive – approximately $1,200 per railcar
- Major railroads already use a land-based tracking system
- Current technology can't pinpoint locations accurately enough

Military vs. Civilian GPS

GPS is a satellite-based radio navigation system developed by the U.S. Department of Defense. GPS allows users to determine their location three-dimensionally 24 hours a day in all weather, anywhere in the world.

Currently, GPS provides two levels of service – a Standard Positioning Service (SPS) for general civilian use and an encoded Precise Positioning Service (PPS) primarily intended for use by the Department of Defense.

The SPS signal isn't as accurate as the PPS signal, which is scrambled to prevent enemies from targeting it. While PPS pinpoints the location of an object to within 3 feet, SPS can only pinpoint an object to within 110 yards.

– *Linda Rosencrance*

GPS Accuracy May Improve

$33M more needed to fix inaccuracies

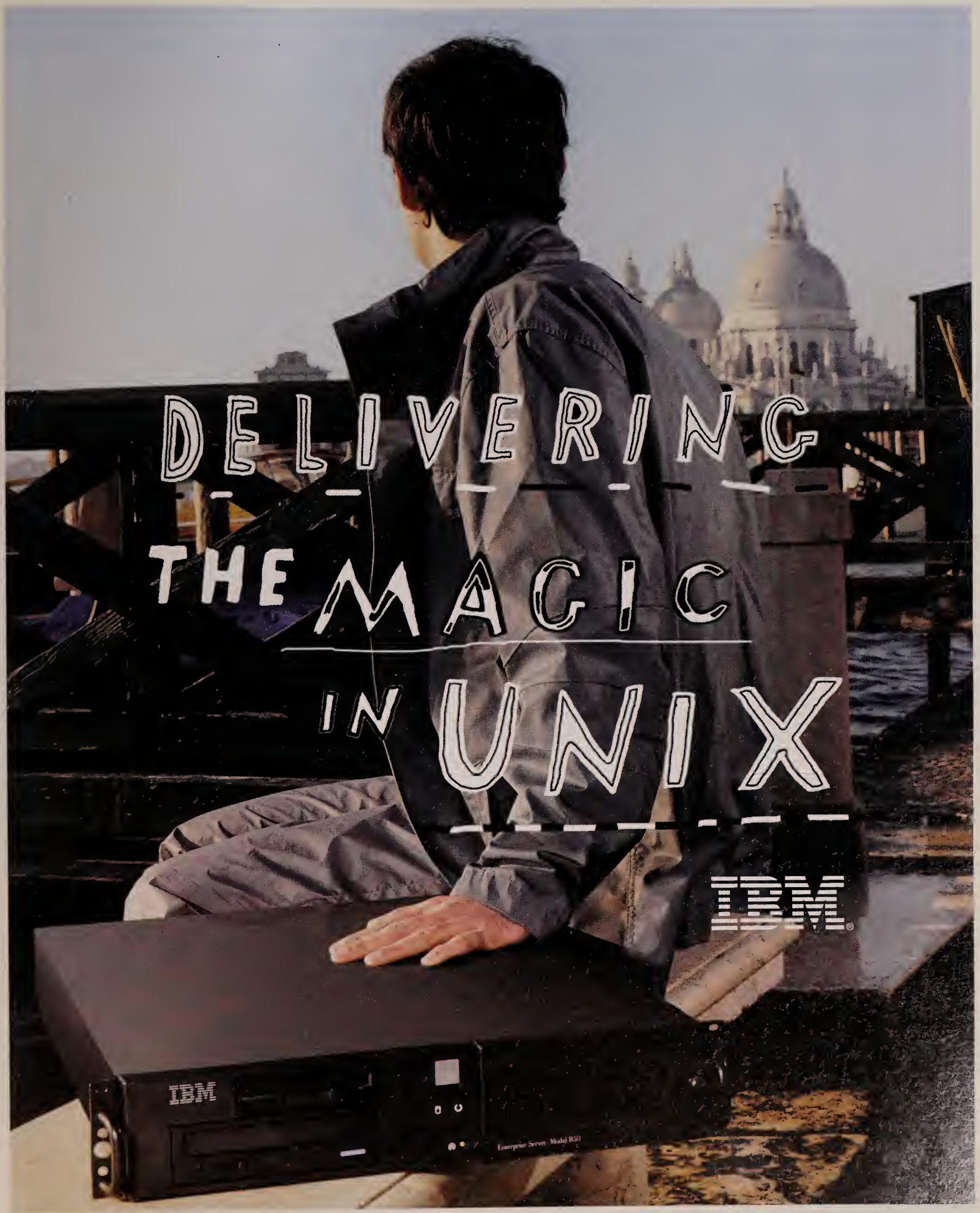
BY LINDA ROSENCRANCE

In the not-too-distant future, civilian users of Global Positioning System (GPS) technology, such as railroad operators, will be able to pinpoint the locations of their equipment much more accurately, according to John M. Samuels, vice president of operations, planning and budget at Norfolk Southern Corp. in Norfolk, Va.

Last year, as part of the effort to make the system more responsive to the needs of civilian users worldwide, Vice President Al Gore announced a $400 million initiative to modernize GPS by adding a second signal in 2003 to be used by civilians for applications that aren't critical to public safety, including the tracking of railcars and locomotives.

Samuels said the railroads are asking Congress to appropriate $33 million to install a nationwide differential GPS — which would correct the inaccuracies in the satellite-based system and allow for a location reading to within 3 feet — for the transportation industry.

"Nationwide differential GPS gives the railroads what they need: a more accurate tracking system," he said. "And the railroads are preparing for using [differential GPS] by looking at how to integrate it into their systems."



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IBM IS DELIVERING ON UNIX DOWN THE ROAD. IBM, working with Intel and SCO, is developing the UNIX operating system for the new 64-bit Intel architecture, code name Monterey/64. We're planning to have Intel® Itanium™ processor–based UNIX servers on the market when this new processor becomes available in volume – as early as this fall. Later in the year, we plan to offer enhanced versions of S80, using silicon-on-insulator technology. We anticipate performance benchmarks that many believed impossible even just a few months ago.

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Few Internet companies have grown faster. As a giant in Web retailing, buy.com relies on IBM for high-volume Web servers it won't outgrow.

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Open standards are the key to the next-generation Internet. The long-term growth of the Internet is about common application platforms and integration. We believe Linux represents tremendous progress in both of these directions. On the e-business Richter Scale, Linux is an 8.9 shift in the technology world. Linux is here to stay. IBM is making an enormous commitment to Linux (compare it to Sun's and HP's), to the advancement of the open souree movement and to eustomers who are betting their e-businesses on the World Wide Web and the next-generation Internet.

- **Already, we have alliances with Red Hat, Caldera, SuSE, TurboLinux and Yellow Dog.**
- **Today we have Linux-ready RS/6000®, Netfinity® and S/390® server platforms.**
- **IBM has already delivered the core of our application framework for e-business on Linux, including DB2® Universal Database™, WebSphere™ application server, Lotus® Domino™ and VisualAge® for Java™.**

The IBM Linux story is exciting and still developing. The IBM UNIX story is as eomplete as anyone else's in the industry. To learn more about IBM UNIX solutions, special trade-in and upgrade offers and Start Now packages, go to www.ibm.com/magiebox/unix.

IBM @ business servers. Technology. Innovation. Magic.

BRIEFS

L&H to Buy Dragon

Speech technology company Lernout & Hauspie Speech Products N.V. (L&H) has agreed to acquire rival Dragon Systems Inc. in a deal valued at $592.7 million. L&H, which splits its headquarters between Ieper, Belgium, and Burlington, Mass., said it hopes to immediately gain access to new markets from the extra languages that Dragon supports. The company expects to leverage Newton, Mass.-based Dragon's resources in telephony, medical, legal and health care applications to expand its offerings and customer base, L&H officials said.

Nortel Forms Unit for Business-to-Business

Nortel Networks Corp. last week announced the establishment of a business-to-business services unit and an alliance with Andersen Consulting in Chicago to help develop and sell some of the new unit's products. Brampton, Ontario-based Nortel retooled two recent acquisitions, San Jose-based Clarify Inc. and Bohemia, N.Y.-based Periphonics Corp., to form the new unit.

Cisco to Purchase SightPath for $800M

Cisco Systems Inc. last week said it will purchase SightPath Inc., a privately held, Waltham, Mass.-based maker of Internet appliances, in an all-stock deal valued at about $800 million. Cisco is interested in SightPath's content-delivery appliances, which will help Cisco's customers deliver live streaming media, high-reliability hosting and other capabilities, according to a statement from San Jose-based Cisco.

Xerox Denies Cuts

Xerox Corp. in Stamford, Conn., denied published reports that it will cut 3,000 to 5,000 jobs from its workforce of 94,600 employees. A Xerox spokeswoman last week declined to comment on possible job cuts or a restructuring charge. But the company said in January that it expected "a substantial restructuring charge" for the first quarter, which ended March 31.

Making Novell an Internet Company

CEO Eric Schmidt discusses new strategy, Linux and the viability of NetWare

AT BRAINSHARE in Salt Lake City last week, Novell Inc. Chairman and CEO **Eric Schmidt** outlined his "one Net" vision of eliminating the boundaries between intranets and the Internet using Novell Directory Services (NDS) eDirectory to control e-commerce relationships with customers and business partners.

Novell introduced an architecture called Directory-enabled Net Infrastructure Model (DENIM) for delivering this vision. DENIM pieces together offerings from Novell and its partners into a platform for delivering Internet-based, modular and cross-platform services. Schmidt discussed the company's strategy with *Computerworld* reporter Dominique Deckmyn.

Q: DENIM sounds like Next Generation Windows Services, the Internet-based services Microsoft Corp. has started to discuss. How would you contrast the two?
A: Microsoft is very good at copying others. Since 1994, in my previous job [as chief technology officer at Sun Microsystems Inc.] and here, I have been talking about a world where you have services that are made available over the Internet and that are consumed by multiple clients using HTML and XML. That's a key part of what Bill Gates has been talking about. And my answer is, "Welcome to the club."

The difference is that they have a very Windows-centric view, and that's a view I don't think is correct.

Q: A key challenge for Novell is to get software vendors to develop for NDS and DENIM. This has been a problem for NetWare. Are you going to have an easier time with DENIM?
A: We think so, and I'll tell you why: We think most people will use this platform using XML or JavaBeans [to access Novell services]. The creation of interfaces of that type is not a core competency of Novell — witness the lack off success of NLM [NetWare Loadable Module] interfaces as a general interface. So my guess is we'll do very well because XML and JavaBeans will be successful.

STEVE BORNS

NOVELL'S SCHMIDT says that, in most cases, Linux and open-source business models are "unproven"

Q: Many vendors, including Sun, The Santa Cruz Operation Inc. and IBM, are endorsing Linux or the open-source movement in some way. Novell has announced a port of its directory, but isn't there more of an opportunity for Novell?
A: There is not in fact a standard model for working with the Linux phenomenon. There's not a standard set of terms, there's not a standard contract, and in almost all cases, the models are unproven. So what we decided to do was take NDS and put it on top of Linux and then get the common management and interoperability that is Novell's strength to apply to Linux as well. So my view is: Let's get that out, see what customers say and then iterate from there.

Q: Have you considered an open-source future for NDS or NetWare?
A: Sure, we've talked about that. But again, I think the models are unproven. And you are using [the term] *open source* without definition. Every one of the companies that you named uses it in a different way. We have thought about [giving NDS away for free], and we have done bundles and promotions. It's still under discussion.

Q: The NetWare business has stabilized, but it's losing market share, is it not?
A: The NetWare business is growing. You have to be careful what you compare. We use the number of between 10% and 20% [revenue] growth per year. Unit growth should be low, because one of the benefits of NetWare is you can reduce the number of servers. In general, Novell's market share has declined very slowly as measured in units. I'm not going to be worried about that as long as it is server consolidation rather than throwing NetWare out.

Internet Data Centers Offer More Uptime to Customers

Provider guarantees 99.999% reliability

BY MARK HALL

With an announcement last week from a Silicon Valley service provider, the Internet data center model now stands toe-to-toe on reliability with traditional S/390 glass houses, but without the distance limitations of IBM's Sysplex technology.

Conxion Corp. in Santa Clara, Calif., wowed analysts with its plan to offer in May its FailSafe Hosting Service with a service level agreement (SLA) offering a 99.999% uptime guarantee. If a Solaris or Windows NT server goes offline for 26 seconds, service for the month is free.

Joanna Makris, an analyst at The Yankee Group in Boston, said Conxion's SLA surpasses others that she's seen, and it underscores the advantage of a service provider that owns its own network backbone.

But analyst Warren Wilson at Summit Strategies Inc. in Boston said Conxion's offer, while better than those of most of its competitors, is part of a trend. Data Return Corp. in Irving, Texas, offers 99.995% availability on its Windows NT-only data center. And start-up Intira Corp. in Pleasanton, Calif., has a guarantee of 99.95% availability, regardless of application.

Micronpc.com, a division of Micron Electronics Inc. in Nampa, Idaho, will offer a "five nines" SLA with its HostPro service if the application is built with a specific tool set and verified by Micronpc.com.

However, Conxion's "proactive" SLA includes better management tools and financial considerations, Makris said.

Information technology managers who run mission-critical applications but can't invest in redundant infrastructure will be interested in these SLAs, said Courtney Munroe, an analyst at International Data Corp. in Framingham, Mass.

In a related development, IBM and Qwest Communications International Inc. have agreed to build and manage 28 North American data centers over the next three years.

Despite this deal and expansion of data centers by Conxion and others, there appears to be little concern about a glut of data center capacity.

"If you look at the projected petabyte storage growth needs, we're barely ahead of the curve," said Joe Butt, an analyst at Forrester Research Inc. in Cambridge, Mass.

MARYFRAN JOHNSON

The no-spoof crusade

IN A SHOW OF INSTRUCTIVE MISCHIEF, a reader not too long ago sent me e-mail that arrived from myself. I'd been spoofed. This fellow (clearly a man with time on his hands and a mission in his heart) intended me no harm. But he wanted to show me how pitifully easy it was to slip into my e-mail system and borrow my online identity.

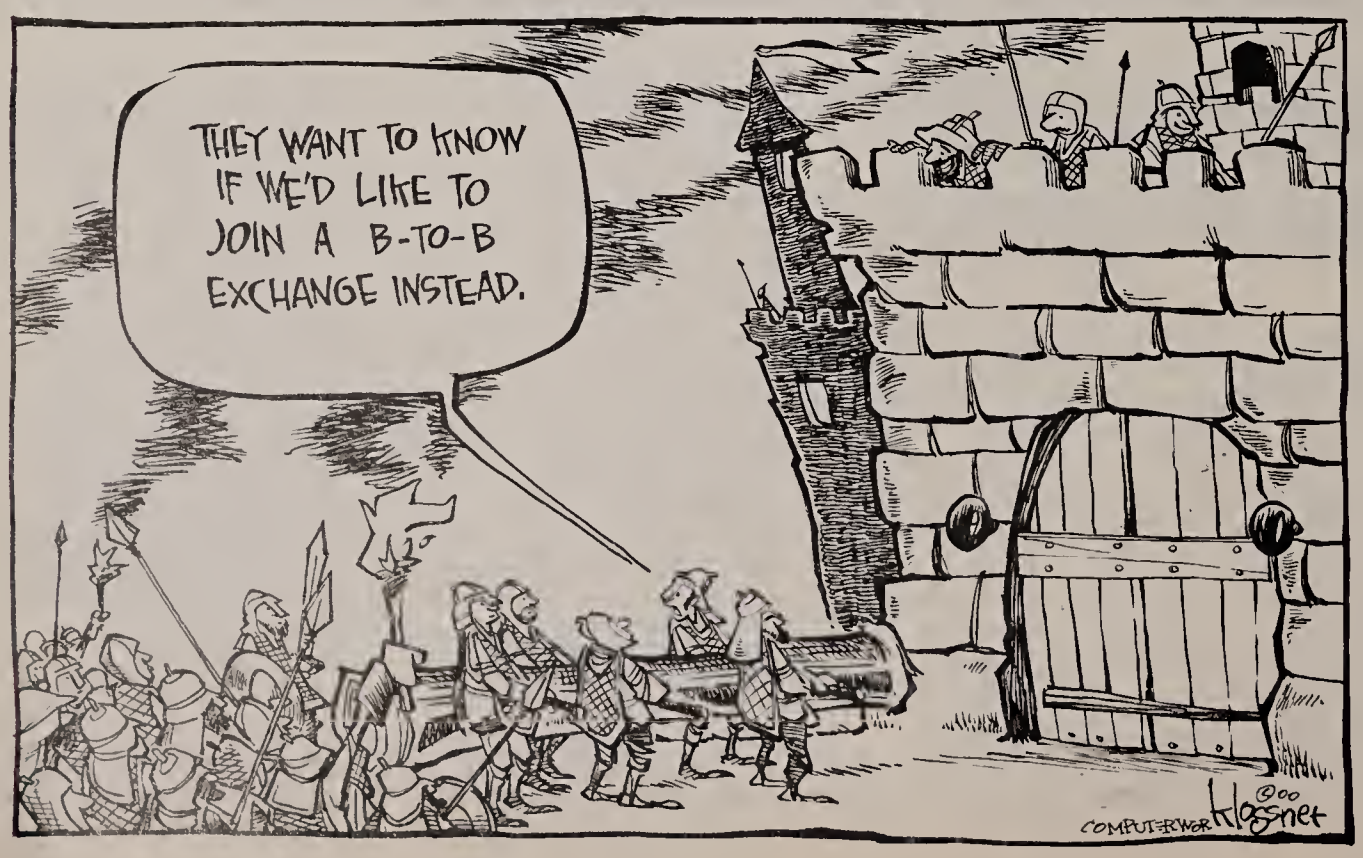
When the wave of distributed denial-of-service attacks disabled several prominent Web sites last month, I didn't even connect my minor spoofing incident with that widespread, costly havoc. But it was that ability to spoof — to deliberately craft false return addresses — that helped those (still unidentified) crackers hide hundreds of Internet-connected desktops they had turned into unwitting attack dogs. This is the dark side of anonymity on the Net: the ability to skulk around, implant malicious code, then mask the damaged sites with spoofing.

MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at **maryfran_johnson@computerworld.com.**

The Internet community has long had the power to stop spoofing, right in its nasty, trackless path. How? Through the relatively simple defensive maneuver of network router filtering. If crackers can't spoof, they can't run and hide. The catch? It'll take a virtual village of businesses, universities and government agencies to use such filtering to make it widely effective.

Last week, the SANS Institute issued an urgent call to action to the Internet community. It posted a free set of guidelines at *www.sans.org/dosstep/index.htm* that can be used to halt infected IP packets on their way through router gateways. The guidelines were drafted by UUnet and tested extensively by more than 100 member organizations, including Cisco, Mitre Corp. and the major Internet service providers. This week, Mitre plans to release a free software tool that any of us can use to verify that our Net access provider is using router filtering and protecting us from spoofing.

The once-cloistered world of Internet citizens is where we all live now, and most of us want to feel safe in our communities, among neighbors we can trust. SANS's antispoofing crusade is a very timely cause and a great opportunity for the IT community to lead. So seize the moment. Oh, and be suspicious of any e-mail from me. ◗



JOHN GANTZ

Digital markets have arrived, so strap yourself in!

I'VE BEEN RACKING MY BRAIN trying to find a word or phrase to describe what the new digital marketplaces will do to information technology departments. I keep coming up with movie titles about asteroids about to hit Earth. *Armageddon*. *Deep Impact*. Take your pick.

By now you know that business-to-business e-commerce will dwarf business-to-consumer e-commerce and that trillions of dollars worth of transactions will flow over the Net in a few years. If that were just the use of the Internet to supplant electronic data interchange, proprietary networks or automated fax/phone/Rolodex systems, that wouldn't be a big deal for IT departments. Just another Web-based application.

JOHN GANTZ is a senior vice president at International Data Corp. in Framingham, Mass. Contact him at **jgantz@idcresearch.com.**

But International Data Corp. (IDC) has just published its forecast of B-to-B e-commerce, and there's plenty of news for IT.

Consider the three types of B-to-B e-commerce. The first, in markets where there are lots of customers and a few dominant suppliers, could be called "extranet-based," or selling through the Web site. The second, where a few buyers dominate — such as Ford, GM and DaimlerChrysler in auto parts — could be called "procurement-based." The big buyers dictate how they want their suppliers to tie into their electronic procurement systems.

That's really about all there is for B-to-B e-commerce today. But enter the third type, the thousands of digital exchanges — what IDC calls "digital marketplaces" — that started popping up last year. Did you know there are a dozen such exchanges for wholesaling fish? These favor neither the supplier nor the buyer. But by 2004, they will account for more than 50% of B-to-B e-commerce.

Here's a clue to the immenseness of this change in commerce habits. One of the most well-known start-ups that specializes in setting up these exchanges is VerticalNet Inc., which lost $32 million last year on revenue of $24 million. Yet its market capitalization is $8 billion, and Microsoft just committed $100 million to the company. Birds are flying backward here.

Did you think implementing a commerce Web site was tough? Well, what happens when you

have to serve up your whole inventory to *dozens* or *hundreds* of such exchanges? Or let people track their orders or settle payments? It will be like running the back-office settlements for a brokerage.

Meanwhile, your colleagues in marketing, sales, production and finance will be going nuts trying to keep the company alive as business models change at the speed of light. Do you think you'll be immune?

That's the real problem. Earth-shattering change is implied here, but no one can really predict what's going to happen, just that it will. We're too close to the asteroid to see it well, and it's closing in. You're just going to need the skills, courage and charisma of Bruce Willis to survive.

And you thought migrating to Windows 2000 was a headache. ◗

ALEX TORRALBAS

How the Net endangers a basic American liberty

A RECENT DECISION in California on free speech (or on sending porn to a minor, if you prefer that description of the case) raised an issue that's far more interesting than the particulars of the case. The courts said that the laws were too vague and that prohibiting someone from sending an e-mail containing a "pornographic" image, regardless of who the recipient was — in this case, a cop posing as a minor — violated the sender's First and 14th Amendment rights.

ALEX TORRALBAS is an independent IT consultant and Visual Basic developer in New York. He can be reached at **altest@redconnect.net**.

J. Robert Flores, senior counsel for the National Law Center for Children and Families, objected to the decision, saying, "The companies that run the Net have already won the battle that *the Net is not a free place. It belongs to the people who own the hardware and software over which you communicate.*" [Emphasis mine.]

This is really an interesting point. And a disturbing one.

Although it is, in fact, absolutely the case today, to say that the access points to the Net — such as America Online, your Internet service provider or your company — are private entities that are entitled to censor you or set anti-free-speech rules, regardless of their constitutionality, is shocking. And it covers *everyone in America.*

That struck me as being the equivalent of, say, Bell Atlantic or GTE setting rules on what I can say on the phone. But any Internet service provider can say, "Anyone using foul language or transmitting 'lewd' material will be booted [read: censored]," in effect giving corporations a choke hold on the First Amendment.

Could I put up my own server and say whatever I darn well please? Yes, but I would still need to connect it to the Internet, and my bandwidth provider would almost certainly reserve the right to pull the plug on me if it objected to my site — even if it's legally protected speech.

The Internet has become something of a legal twilight zone, with the courts being asked to decide, in effect, "Does the Constitution apply to the Internet?" That the debate even exists is pretty scary. Too many judges, attorneys and legislators have a woefully deficient knowledge of technology and tend to view the Net as some alien thing to be handled with rubber gloves.

Some cases presented to the court are fairly clear-cut (like the Communications Decency Act), and judges have, thankfully, blown them out of the water.

But what's scary is the idea that all Internet access, and therefore all Internet speech, can be owned by private entities that can make up their own rules.

Flores' quote by itself can serve as a call to action for those of us who want to keep the Internet a free and lively place to ask our leaders to pass laws protecting our rights from arbitrary corporate censorship.

It is indeed true that your Internet service provider, AOL and others are private entities and entitled to set their own rules. But the Internet doesn't belong to them. All they provide is the link. When service providers have been sued for the content on their servers, they have rightly — and successfully — argued that they're just a conduit and not responsible for the content their subscribers create or trade. Very honorable? More like self-serving, albeit serving the greater good.

What we should ask for is a law that says, "If it's legal, you can't censor it." All Internet service and other providers would have to strike any "terms of service" that violated this law. The Constitution's free speech protection doesn't stop at your service provider's doorstep. Then, the Net would indeed remain free and it would be established that it belongs to everyone. ◗

READERS' LETTERS

Y2k worth the worry

GEOFFREY JAMES' premise that Internet security wasn't addressed years ago because everyone was foolishly focusing on the so-called Y2k bug ["Y2k Waste Left IT Unprepared for a *Real* Problem," News Opinion, Feb. 28] is the most shallow, illogical and laughable theory I've read of late.

Granted, there was a lot of Y2k hype. However, the consequences of not addressing the problem could have been devastating. According to James, contingency plans were a waste of money. I bet each organization that went through that planning process improved its ability to respond to disasters.

James misses the point entirely. While IT professionals are conducting business, hackers sit around all day and think up ways to disrupt that business. A few Web sites suffer denial-of-service attacks and James concludes my entire profession is gullible, gutless and totally without ethics.

Cindy Romines
Longview, Texas

UNDOUBTEDLY, all of us can think of an infinite number of ways that the $19.9 billion spent worldwide on contingency planning for Y2k could have been more productively allocated.

If the IT community believed that Y2k was all hype and hoax, why did CEOs and CIOs consent to spend as much as they did? Even if IT managers believed that Y2k would prove to be a nonevent, no one wanted to chance being caught with his pants down.

Christine Handerhan
Business systems analyst
J. P. Morgan & Co.
New York

AS A programmer, I can tell Geoffrey James that had we left Y2k to itself, many important computer systems would have failed.

James needs to realize that although the Internet is everyone's hot topic, it's not vital to the life of the average person. No one is going to die if James' Internet access is interrupted by a few hackers. But lives really do rely on other systems that really would have been affected by Y2k.

Jim Winski
Aurora, Colo.
Jim@winski.com

'New Kids' not unique

I READ WITH GREAT interest your article "Keeping the New Kids" [Business, Feb. 21]. You say they're smart, savvy, ambitious, eager and determined to have a life.

I've got news for you: so am I. I may not be a "new kid," but I subscribe to all the same goals these young people have. Didn't we all have the same hopes and dreams when we started out?

Hans Dekkers
IT manager
Nachtmann USA Inc.
Warwick, R.I.

AS A NEW IT worker who isn't a twentysomething, I think the needs and goals expressed by my younger counterparts in IT speak for all IT workers, not just younger ones. I too am looking for a place to grow, feel challenged, learn and stay long term. Maybe if companies embraced some of the notions expressed in the article, we could shed the two most offensive stereotypes associated with IT, specifically that younger IT workers don't have any commitment and that older IT workers can't learn anything.

Mike Snyder
Systems engineer
Denver

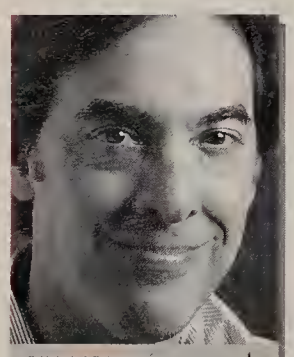
COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification

BILL LABERIS

IT may ache when the e-party is over

NOTWITHSTANDING the difficulties in engineering e-commerce applications, the track to building them has been one cushy ride on the gravy train. Basically, the classical test of worthiness of IT investments — accountability — has often been only leniently applied to e-commerce projects.

Fasten your seatbelts, because the ride is about to get a whole lot bumpier. There are many indications that investors and company executives are going to demand much more accountability (as in profits) from their prodigious e-commerce investments. For IT, this could spell a whole new round of headaches and demands.



BILL LABERIS is a consultant in Holliston, Mass., and former editor in chief of *Computerworld*. Contact him at **bill@laberis.com.**

Data presented at the recent International Data Corp. (IDC) Directions 2000 conference revealed that executives expect your e-commerce sites to make money, and soon. Imagine that! IDC sampled opinions of executives who own the budget for online business at more than 600 companies. *Sixty percent* of them said they expect their firms' online businesses to be profitable by the end of next year. I found that amazing because hardly any make money today. Such expectations are sure to put increasing pressure on IT to help deliver profits.

Also, investors that had outrageously bid up the value of dot-com businesses are beginning to smarten up. Prominent Wall Street analysts, who control the ebb and flow of so much investment money, now say that upward of 75% of Internet companies will never make money. Many of the same analysts who helped drive the absurd values of many Internet companies now lament that they're overvalued. This could translate into stingier budgets for e-commerce infrastructure or far greater accountability for such outlays.

Finally, the poor showing of many business-to-consumer Internet companies in fulfilling orders during the holiday season reinforced the idea that many dot-com wonders are just flashes in the pan. There is a growing belief that in business-to-consumer e-commerce, what will emerge is a small number of giant conglomerates like Amazon or eBay, with everyone else either striking partnerships with the giants or simply disappearing.

These are quite different and sobering versions of e-commerce reality than you've been accustomed to reading and hearing. For example, conventional wisdom formerly held that Internet technology would spawn countless competitors in one of the truest expressions of free-market capitalism. If the aforementioned oligarchy model prevails, what effect would that have on your e-commerce system development strategies? If your company's role ultimately is more of a subordinate to giant "anchor" sites or portals like Yahoo or Amazon, should you be building the infrastructure any differently than if your company operated more independently?

I believe that, at a minimum, IT managers responsible for the build-out of the e-commerce infrastructure will need to focus as much as ever on basics, including building their sites not in isolation, but tightly integrated with existing back-office systems. Tight integration is the only way you can hope to gain the accountability that will be demanded going forward. Only 22% of the IDC panel viewed their online businesses as independent of internal, integrated systems.

The bottom line is the bottom line, which for a variety of reasons now is likely to reinsert itself as a key IT performance benchmark for e-commerce systems development. ◗

MICHAEL CUSUMANO

The secrets of software success

ENTREPRENEURS and managers who want to create a software company or expand their operations and sales overseas need to understand what they're facing in different countries.

I'm often asked why so many U.S. companies are world-class players in the software market. Yes, there are excellent software producers overseas. Hitachi, Fujitsu and NEC usually rank among the top 10 in revenue. Europe has SAP, Business Objects and Baan. Israel has many small software companies. India has a vibrant programming services industry. But only the U.S. has produced scores of companies that create standardized, packaged software for global mass markets. Why?

MICHAEL CUSUMANO, coauthor of *Competing on Internet Time: Lessons from Netscape and Its Battle with Microsoft*, is a professor at MIT's Sloan School of Management. Contact him at **cusumano@mit.edu.**

The answer lies in understanding the *supply side* — the infrastructure and intellectual capital needed to create global software companies — and the *demand side* — local and historical factors that have shaped customer preferences and scale economies.

A supply-side view reveals very different kinds of markets. In some countries, university education in computer science and the number of software developers and entrepreneurs are very good, like in the U.S., Israel and India. In others, education is strong and programmer availability ample. But entrepreneur support mechanisms, such as a vibrant venture-capital industry, are weak in places like China and many European countries. In a third type of market, both education and entrepreneur support are weak, as in Japan — which is changing, but slowly.

The first type is the best base for creating global software companies or expanding a company's operations overseas.

A look at the demand side reveals other market characteristics. One type is global, which demands standardized software products in both "horizontal" segments, such as for basic operating systems or database products, and "vertical" segments, such as for industry-specific computer-aided design software. A second type needs standardized software, but only for local vertical or horizontal markets — for example, Japanese or Chinese word processing (useful only in Japan or China) or tax preparation software useful only in a particular country. A third type looks for customized products like online banking or factory automation systems.

Not surprisingly, U.S. companies have benefited from favorable supply and demand factors. Government has played a big role; lots of defense spending drove university research and the computer hardware and software industries during the 1950s, '60s and '70s. But to become a global software company, you must write the equivalent of a best-seller or establish a monopoly that's the bridge everyone needs to cross. This kind of market requires scale economies and the ability to set global standards. Microsoft has mastered this like no other company. But, as we see in Europe and Asia, the other two types of markets are easier to play in. They require mastery of only one local market or application domain or a close relationship with only a few customers.

Supply and demand factors have also contributed to different environments for entrepreneurship. In Europe, software has traditionally been more of a science. There is excellent education in computer science and mathematics, and a few local entrepreneurs and computer scientists have exploited concepts such as formal methods and object-oriented designs. But programming "elegance" often dominates, and few companies have understood global customer needs well enough to create standardized products that dominate international markets.

In contrast, many Japanese programmers have treated software development more like a production problem. The domestic market is large — second only to the U.S. — but customers usually want tailored products. In response, companies have emphasized customization and the precision engineering of basic applications. So we have software "factories" and production dominated by companies that are mainly hardware producers and systems engineering firms.

U.S. programmers and entrepreneurs are probably unique. Whether the company is Microsoft, Oracle, Novell or Intuit, software is a business to a U.S. firm, not an art or science. Understanding this distinction is the first requirement for building a world-class software company. But understanding the structure of supply and demand in specific foreign markets is equally important for U.S. firms to take their business overseas. ◗

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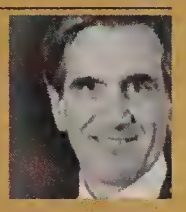

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BUSINESS

AT YOUR SERVICE

Already recognized for its focus on service, FedEx turns to BeaSphere's customer relationship management services to sharpen the quality of its Web site and better respond to clients' needs. ▸ 36

KEEP ON TRUCKIN'

Trucking companies are rushing to the Web, where new sites and exchanges can help them match loads with truckers, coordinate logistics and cut costs. ▸ 36

ASP MODERATION

Application service providers aren't always the best bet for large, established companies, says Kevin Fogarty. But they make perfect sense for businesses branching into new areas such as e-commerce. ▸ 38

INDIAN INFLUX

Half of all H-1B visas are issued to people from India. And the number of Indian-led start-ups is booming, thanks to sophisticated networks and support within the high-tech community. ▸ 39

LIFE AT THE *TRIB*

Wonder what it's like to work for the IT department of the company that publishes the *Chicago Tribune* and owns part of the Cubs? Kathy Ameche, CIO at Tribune Co., gives us the lowdown. ▸ 40

ETHICS OVERHAUL

Conference sessions that offer advice such as "how to leave kindness and decency behind" are indicative of a moral decline in IT, says Paul A. Strassmann. He says it's time for industry leaders to clean up their acts before the government does it for them. ▸ 40

JUMPING SHIP

Have your workers been speaking in hushed tones lately? Coming to work impeccably dressed? Or surprisingly silent about future projects? Sounds like they're getting ready to jump ship. Here's how to spot the signs. ▸ 42

STAR CATCHERS

Your employees may excel at their jobs, but that doesn't mean they're happy. James Waldroop, co-author of a *Harvard Business Review* article titled "Job Sculpting: The Art of Retaining Your Best People," offers tips on how to hang on to your star employees. ▸ 44

JUST IN TIME

How do you stay ahead of the curve when new information is being churned out faster than you can say "professional development"? Today's workers are turning to technology's new just-in-time learning tools. ▸ 50

DRIVING SOME HARD BARGAINS

If you aren't careful during negotiations with contractors, you could wind up giving away the farm, warns Joe Auer. Creating a "zone of consideration" can help ensure that you stay in charge. ▸ 53

EDWARD SANTALONE

MORRIS GREEN AND JUDY KARPEL, partners at IT recruiting firm Hayward Simone Associates, offer some advice for those looking to fill IT job openings: Move quickly, and be prepared to compete with dot-coms

WHAT ARE IT'S HOTTEST JOBS?

JOB SEEKERS TAKE HEED: It's your market. The demand for jobs is booming, say analysts, and this quarter all eyes seem to be on e-commerce. Those with the right skills and experience are certainly in the driver's seat. So what are the best jobs out there? How much do they pay? And what does it take to land them? See the results of *Computerworld*'s quarterly National Survey of IT Leaders for some answers.

46

BetaSphere Delivers FedEx Some Customer Feedback

Courier hires firm to appraise customers' online experiences, suggest improvements

BY LINDA ROSENCRANCE

SINCE LAUNCHING its Web site in 1994 to make it easier for consumers and businesses to access its services, Federal Express Corp. hasn't slowed down its push to improve customer satisfaction.

In fact, FedEx says it's so committed to giving its customers the best possible service, it has hired BetaSphere Inc., a Palo Alto, Calif.-based provider of Web-based customer-feedback software and services, to implement customer feedback programs to evaluate the FedEx Web site.

"Our studies show that customer satisfaction improves when we are able to incorporate their feedback before we [launch new services]," said David Roussain, vice president of e-commerce marketing at the Memphis-based shipping company.

BetaSphere has been recruiting FedEx customers from around the world to evaluate FedEx's Web site for ease of use and navigation, explained Phil Davis, vice president of sales and marketing at BetaSphere, which began working with the shipping company about a year ago.

The bottom line, he said, is to gather customer feedback that will help FedEx make changes to its Web site to improve customer satisfaction.

During BetaSphere's customer feedback study, evaluators are asked about the accessibility and content of the information on the Web site. They are also questioned about the quality of the presentation and ease of navigation, explained Claire Ruddy, manager at FedEx.com.

One U.S. customer pointed out that most people visit the site to track their packages and suggested that FedEx put the package-tracking window right on the home page.

"And we did that," said Ruddy.

FedEx also took the advice of another U.S. customer and developed an online application that lets customers order supplies.

"We learn what the customer wants," said Ruddy. "We want them to drive our products. In addition to the testing done by BetaSphere, we talk to our customers online on a daily basis."

FedEx's attention to its customers' needs is paying off. The number of customers who used the Web site to ship packages has tripled since February 1999, according to company spokeswoman Sally Davenport. And in the same time, the amount of people who used the site's package tracking function grew by 202%.

"FedEx has done a great job at not only producing a first-rate site, but of implementing ideas put forth by beta testers," said Simon Lidbetter, a former employee at U.K.-based Montal Computer Service Ltd., a FedEx customer and recent BetaSphere program participant.

TAMARA REYNOLDS

FEDEX'S DAVID ROUSSAIN, vice president of e-commerce marketing, says the company improves customer satisfaction by listening and incorporating suggestions into new services on the FedEx Web site

Keeping Up With the Competition

FedEx isn't the only shipping company committed to improving its customers' experiences. Arch rival United Parcel Service of America Inc. in Atlanta also understands the value of keeping its customers happy.

UPS spokeswoman Susan Rosenberg said the company conducts ongoing market research on the customer experience, including telephone surveys and focus groups, to gather their feedback. Customers can also leave suggestions at the UPS Web site, she said.

John Fontanella, an analyst at AMR Research Inc. in Boston, said it's important for shipping companies to keep their customers happy. "[UPS and FedEx] are keeping up with the current state of the industry," he said. ◗

Still a World Wild Web in Trucking Industry

Sites aim to increase efficiency, trim costs

BY SAMI LAIS

E-commerce action in the $450 billion U.S. trucking industry is already giving off sparks, and it's heating up even more with Web sites for load brokers, shippers and providers of information.

"I've counted something like 55 trucking industry service-related sites," said John Fontanella, an analyst at AMR Research Inc. in Boston.

The trucking industry has been behind some others in Internet use, said Bruce Martin, editor at trucking Web portal Layover.com Inc. in Akron, Pa. But the success of existing trucking sites and the increasingly common use of wireless networking will cause "communications in the industry to change more in the next three months than it has in the past three years," he predicted.

Last week, General Mills Inc., Land O'Lakes Inc., The Pillsbury Co., Graphic Packaging Corp. and Fort James Corp. announced plans for a Web-based freight and logistics exchange. By combining shipments, they can "ship in truckload quantities, not [less-than-truckload] quantities," Fontanella said.

Three weeks ago, six of the largest U.S. carriers — Covenant Transport Inc., J. B. Hunt Transport Services Inc., M. S. Carriers Inc., Swift Transportation Co., U.S. Xpress Enterprises Inc. and Werner Enterprises Inc. — announced that they will merge their logistics units into the site *www.transplace.com*. The Web site will match loads with open spots on carriers' trucks and save the companies money by combining the group's purchasing power.

Layover.com added online mapping to its Web portal last month. In addition to free e-mail, trucking news, chat rooms and links to related sites, it offers online databases of loads and routes available through several brokers, via *www.truckstop.com*, for a $25 monthly fee.

The concept isn't new, Fontanella said. "There are a lot of load-matching bulletin board services," mostly dedicated to particular markets.

"Sixty percent of trucking companies in the U.S. have fewer than 99 trucks," said Donald Broughton, an analyst at A. G. Edwards & Sons in St. Louis. Load-matching sites help those companies manage logistics and avoid deadheading — returning from a delivery with an empty truck — since shippers pay only for "loaded" miles.

Shippers and carriers use most sites for free, though shippers often advertise for bids online and then receive bids and award jobs off-line, Fontanella said.

Real-time transactions are coming to Truckstop.com and other similar sites within the next three months, Martin said, and full-fledged auction sites should appear by year's end. ◗

Trucking Sites Proliferate

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KEVIN FOGARTY/BRICKS AND CLICKS

Making the right bet on ASPs

UNTIL I TALKED to Scott Manville, I never really got the whole application service provider thing, at least for big companies.

Manville is a senior vice president at U.S. Trust in New York. He's a smart, experienced IT guy. He thinks ASPs are a good idea — but not for the reasons I'd always heard. The basic ASP concept is to outsource a whole application. You pay a subscription fee, and the ASP hosts the application, runs it, maintains it and upgrades it as necessary.

This makes sense for start-ups that have no existing applications and have to control spending. It even makes sense for small companies that want to outsource jobs like payroll. They've been doing that since long before ASP became a buzzword.

But why would a large, established company want to take a functioning application, such as the horrendously complex, business-critical ERP applications that are most often cited as good ASP candidates, and hand it off to someone else?

Most organizations take years and millions of dollars to bring an ERP system online. It becomes the engine of the business. I assumed outsourcing something that crucial was a Bad Idea.

So did Manville and the other high-level IT managers who were in a Technology Manager's Forum session I moderated in New York a couple of weeks ago.

They said service levels — which are hard enough to define and support within the firewall — are a complete crapshoot once you start piping traffic outside. Security, staffing, reliability and understanding the business processes behind the applications are also lacking at most start-up ASPs.

But Manville and the others still like the idea of ASPs if they add new capabilities — like conducting business-to-business auctions, offering online billing, managing Internet recruitment advertising or sifting through electronic résumés for good candidates.

KEVIN FOGARTY is *Computerworld*'s business editor. Contact him at **kevin_fogarty@computerworld.com.**

Trusting those e-commerce and recruiting functions to a service provider can give you a real advantage — and it doesn't put your core applications at risk.

Signing up with the right collection of ASPs can give you drop-in e-commerce capabilities at a low cost and even lower risk.

With the right contracts, an ASP setup is flexible enough that you can experiment a bit, changing the service providers you use and the functions you provide to get the best mix for your customers. Once you have some experience, it makes sense to bring those functions inside — especially as e-commerce becomes a more important part of your business.

And with your e-commerce capabilities firmly inside your organization again, you can look for a new set of functions you want to try — with a new set of ASPs. ◗

Here's to a faster Web site: the Compaq TaskSmart C-Series server.

Indian Entrepreneurs Take Charge

Indian-led start-ups explode in number

BY JULEKHA DASH

Almost half of all H-1B visas were granted to Indian nationals last year, according to the Immigration and Naturalization Service. China ranked second, grabbing just 9% of the visas.

But increasingly, Indians are doing the hiring themselves. Thanks in large part to mentoring and organized networking efforts, more Indians are heading technology companies of their own.

In fact, this phenomenon has prompted the magazine *Silicon India* to create the Si Tech Index, which tracks the performance of 20 firms founded and managed by Indians both in the U.S. and India. The stock index jumped more than 200% last year. That's compared with 19.5% for the Standard & Poor's 500 index and 102% for the Nasdaq 100.

Most Indian-led technology companies are no more than 3 or 4 years old, according to Christine Comaford, managing director at venture capital firm Artemis Ventures in Sausalito, Calif. "Before that, it was a rarity" to see Indians at the helm of start-ups, she said.

Better Networking

One major reason for the change has been more organized networking among Indians, said Comaford.

The IndUS Entrepreneurs (TIE) has emerged as the preeminent networking group for Indian entrepreneurs.

TIE hosts monthly Angel Forums, in which budding entrepreneurs pitch their business plans in hopes of receiving angel investing or mentoring from charter members. Last year, 37 venture capital firms were TIE sponsors, said the group's executive director, Bakul Joshi. He said he hopes to attract 60 this year.

SUNIL WADHWANI, CEO of iGate Capital

Sunil Wadhwani, CEO of iGate Capital Corp., an IT services holding firm in Oakdale, Pa., estimated that he has provided between $250,000 and $500,000 in angel funding to Internet companies founded by Indians during the past year.

But an entirely different scenario existed 10 years ago, said Wadhwani.

"This network was pretty weak," he said.

In fact, Wadhwani launched his company without any venture capital funding. The first time it got outside help was three years ago, when Wadhwani took the firm public.

Even just five years ago, the outlook was bleak. In 1995, K. B. Chandrasekhar, chairman of Santa Clara, Calif.-based Exodus Communications Inc., said he "knocked on the doors of every venture capital firm," but the view was that Indians, while skilled technically, didn't possess the managerial talent to lead new companies.

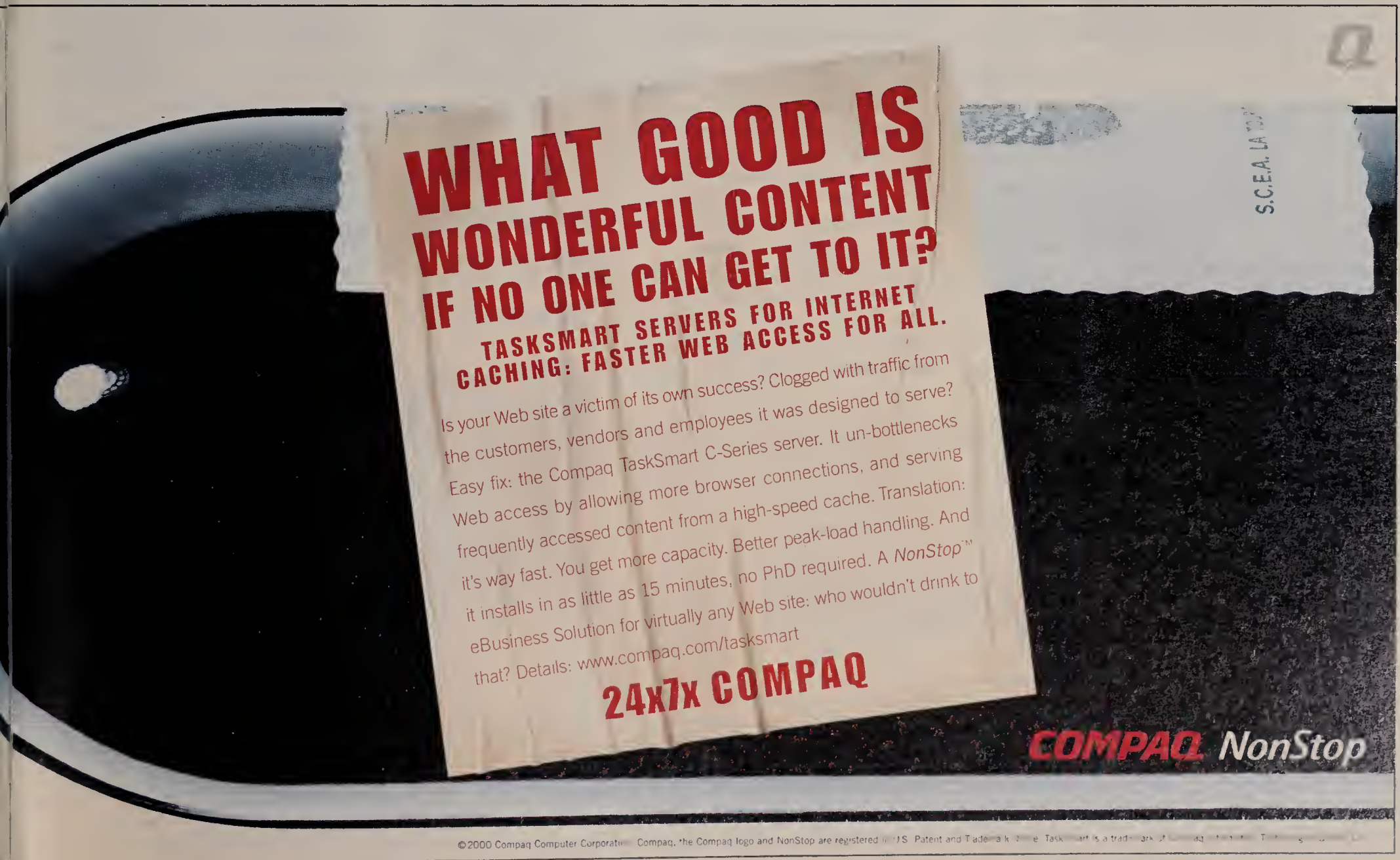
"The credibility of India was not high [at the time] because few [Indians] had been entrepreneurs," said Chandrasekhar, who is also CEO of Sunnyvale, Calif.-based application service provider portal Jamcracker Inc.

In fact, Chandrasekhar's firm was on the verge of bankruptcy when TIE members helped him with an initial $700,000 in funding.

Srini Anumolu, co-founder of Sunnyvale-based eLance Inc., an electronic marketplace for services, said the Internet also has aided Indians.

Before he co-founded eLance in 1998, Anumolu had tried unsuccessfully to run a start-up in San Francisco during the early '90s. But back then, the environment was tough, he said. People needed a lot of capital and a sales distribution channel.

"The Internet levels the playing field" because you don't need a dedicated sales force or shelf space in stores to get a new business running, Anumolu said.



WORKSTYLES

What's It Like to Work at . . . Tribune Co.

Four days after this interview, on March 13, Tribune Co. announced that it would acquire The Times Mirror Co., but it declined to comment on the effect the merger may have on Tribune's information technology organization. "It would be premature to discuss any impact at this point," a Tribune spokeswoman said.

The merger is expected to be complete by the third quarter. The new company will remain in Chicago, and John Madigan, Tribune's chairman, president and CEO, will keep his title.

Interviewee: Kathy Ameche, CIO

Company: Tribune Co. (*www.tribune.com*), a media company that operates newspaper publishing, broadcasting, interactive media and education businesses; owner of the Chicago Cubs baseball team

Main location: Tribune Tower on Michigan Avenue in downtown Chicago

Number of IT employees: 125 in corporate IT, plus 125 to 175 additional decentralized IT employees

Number of employees (end users): About 15,000

Workday: About 8 a.m. to 6 or 7 p.m. for most IT staff, "but we're a 24/7 operation, so there are three shifts in the technical operations center."

This year's major IT initiatives: A PeopleSoft Inc. financial systems implementation; "increasing revenue from our sites and making it easier for viewers, advertisers and subscribers to get the information they need"; the convergence of voice and data over the corporate network.

Hiring plans: "We will be hiring, but not aggressively. Mainly it will be replacement hiring, with some growth hiring in e-commerce, PeopleSoft and end-user support."

Internal career paths: "Tribune is really good at promoting and cross-training and allowing people to move into other areas. You can start in IT and end up in a business role in broadcasting, for example."

Bonus programs: Sign-on bonuses, spot performance bonuses, formal annual bonuses at certain management levels and quarterly awards based on peer recommendations

Dress code: Business casual

Types of offices: Cubes on interior with offices on perimeter for directors and above. "We're putting together a lab where we'll be able to do some creative thinking and work with new technologies. It will feature a duplication of our environment so we can run tests of upgrades or new routers before we put them into the production environment. . . . We're geeks. We love our toys."

Must people carry beepers? Cell phones? Both. On-call employees have laptops and dial-up access from home that's paid for by the company. Managers and executives carry Palm devices provided by the company.

Telecommuting policy: "We don't have one at the moment. A predecessor of mine experimented with telecommuting, and it didn't work out. We'd like to try it again, but we're not there yet."

On-site health club? "Not yet, but it's on the drawing board."

In-house cafeteria/food service: Yes.

The one thing everyone complains about: Parking.

Favorite gossip topics: "Will the Cubs win the pennant?"

Little perks: "Getting new technology, like the PalmPilots and the latest laptops; access to Chicago Cubs tickets; hobnobbing with *Tribune* reporters in the elevators. . . . A year ago we had a push to increase quality, and after that we all got to play baseball at Wrigley Field."

Would employees feel comfortable e-mailing the CEO, John Madigan? "I don't see why not. I would think so."

Quote: "In 150 years of publishing the *Chicago Tribune*, we've never not gotten the paper out the door. We're very proud of our history and who we are and what we do, and the IT staff supports that."

– Leslie Goff

PAUL A. STRASSMANN

Practice ethical IT

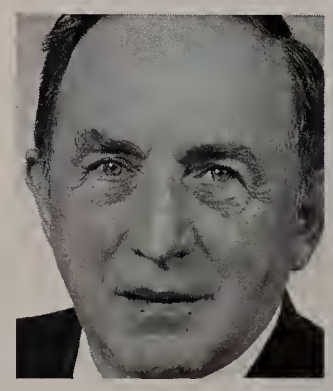
PRACTITIONERS IN MOST major professions subscribe to codes of ethics that govern their behavior. Trust is thus linked to expectations that a privileged expert will behave ethically. Such an outlook is essential in order for a modern society to operate, because we depend on the fairness and good judgment of an advantaged few to tell the truth, abstain from giving self-serving advice and offer warnings when waste of valuable resources is discovered. Otherwise, corruption will invariably creep in, opening the door for government intervention.

My interest in the relationship between ethics and computing goes back to 1981, when I authored the code of ethics for the Data Processing Management Association. Professionals who successfully passed the examination to obtain a certificate in data processing had to pledge adherence to this code. To see how we have become accustomed to lower standards of morality, as well as the rising insensitivity to IT errors, consider the following:

■ A forthcoming conference for IT leaders features a tutorial that includes as topics "how to make other people cringe and whimper when you enter the room," "how to get what you want when you want it whether you deserve it or not," "how to act . . . without morality," "how to leave kindness and decency behind" and "how to seize the future by the throat and make it cough up money." The entire conference is offered to IT executives for a fee of $2,380 each and to consultants for $10,000 each, with an additional opportunity to purchase a book that includes lessons on "how to get mean and nasty" and how to "lie when necessary."

■ Microsoft launches Windows 2000 with claims of its extraordinary reliability, but its own list of potential defects and required fixes, which come to light a week after it released the software, is testimony to the company's long-standing track record of releasing fault-prone products. One of Microsoft's own developers rationalized this situation by stating, "[T]he fact that Microsoft found that many bugs indicates just how thorough their testing processes are, both prior and after releasing new software." A misleading demonstration of Windows 98 by a key Microsoft executive before a federal judge last year is another example of how many employees in that wealthy firm subject customers to a skillful cover-up of the truth.

IT runs the risk of inviting government regulations.



■ *InfoWorld* columnist Bob Lewis [Feb. 14] contrasts the admittedly ample and successful Y2k spending with the 30% success rate for all other IT projects. He argues that such an excessive failure rate may be the result of too-tight budgets. This argument suggests that since IT project proposals aren't trustworthy anyway, management ought to always increase IT funding for projects to succeed like the Y2k nonevent.

■ America Online releases Version 5.0 of its software, which interferes with other computer programs and Internet service providers without prior notice and without permission from the customer. It tends to disable, interrupt, alter and interfere with competing software offerings. This case is an example of the arrogance that has become accepted behavior by IT software suppliers.

Executive Implications

Marie Antoinette, who like her husband, King Louis XVI of France, was beheaded in 1793, is popularly thought to have said, "Let them eat cake," when she heard that peasants didn't have enough bread and were starving. I hear too many examples of a similarly smug disregard of IT troubles.

No one will lose his head over this. But IT runs the risk of inviting government regulations and mandatory compliance with "best practices" promulgated as universal codes, which will greatly erode all the personal freedom, creativity and prosperity with which computer professionals have been blessed so far. To postpone this, get a copy of any code of professional ethics (see *http://csep.iit.edu/codes/computer.html*), put it into practice, and demonstrate less tolerance for many current transgressions. ◗

Strassmann (paul@strassmann.com) advocates regulation-free pursuit of professional work, as long as it's accompanied by an ethical sense of accountability.

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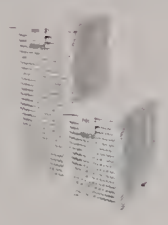

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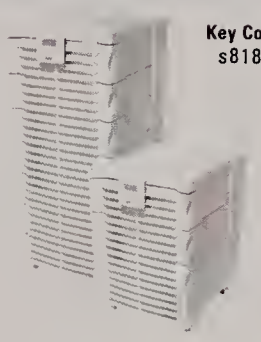

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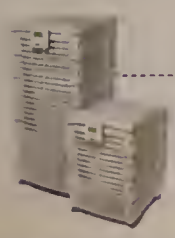

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Signs of Defection

DAVID CLARK

Want to hold on to your key staffers? Watch out for the warning signals they may be giving off if they're thinking about jumping ship.

By Steve Ulfelder

WHEN MARK WINSTEAD WAS ABOUT READY TO quit his old job, he actually grew *less* annoying to his manager. No longer an information technology rabble-rouser rallying for better working conditions, "I didn't give too much care anymore about job training issues, growth opportunities," he says. "I guess some thought that [the shift in behavior] was maturity, while others recognized it for what it was: looking for the next passing ship."

Winstead is now a very content systems programmer/analyst at Bethesda, Md.-based Lockheed Martin Corp.'s Technical Services division. His torpor in the final months at his prior job is textbook behavior for IT pros who are ready to vamoose, according to experts. By waving the white flag on working conditions, Winstead was waving a red flag that an astute manager could have noticed, perhaps preventing his departure.

You know turnover is Problem No. 1 in IT departments. You know that you're paying more attention than ever to retaining IT workers. Bringing new people up to speed is a pain in the neck — and they're unknown quantities who may not be *worth* bringing up to speed.

But do you know how to read the signals employees send when they're thinking about bailing out? Those signals can be counterintuitive, as can responding to them correctly. And how do you sort out the *might-be-salvageables* from the *snowball's-chances*?

Profile of a Ship-Jumper

Here's the good news: There's a pretty reliable profile to identify workers most likely to be looking around. The bad news: It's a profile that probably fits an awful lot of your employees. People who've been out of college five to 10 years and hold electrical engineering or computer science degrees are the ones to watch, according to Fran Quittel, a high-tech career expert who authors *Computerworld*'s "Career Adviser" column and has created the career Web sites *www.careerbabe.com* and *www.yourcareer.com*. Other experts place the danger range at five to seven years. But all agree with Quittel when she says, "If you're not getting people up to speed in different technologies, you're going to lose them."

"If the work's boring, people don't stick it out," says Ken Surdan, CIO at Send.com, an online gift company in Waltham, Mass. Send.com has a negligible turnover rate — partly because it's a hot pre-initial public offering start-up, but also partly because Surdan tries to spread the tasty projects around to keep the entire staff excited.

New challenges go hand-in-hand with hot technology. According to Patricia Christensen, vice president of human resources at Chicago-based software vendor Cyborg Systems Inc. and co-chairwoman of the Arlington, Va.-based Information Technology Association of America's Human Resources Forum: "If there's a lack of challenge in the work they've been given or they've been in the same position for a very long time," IT workers are bound to be "looking for challenging opportunities."

Even more than other professionals, IT workers believe, "I have to watch out for myself, keep my skills relevant and marketable," Surdan says. If you aren't helping them stay up-to-date, you're pushing them out the door.

Steve Thornburg started to think seriously about leaving a job in March one year. "By September, I decided Thanksgiving would be my cut-off date," says the engineer, who has more than 20 years' experience in IT. "I felt disappointed and I felt sad" about a turn of events at his company.

Early Warnings

Some signs that an employee is testing the waters are pretty obvious. Some aren't. Here's a list:

- They come in late and leave early. "Here, people stay until the job's done," Christensen says. "If they're not spending the time, you can pretty much tell" something is wrong.
- "They start taking sick time, taking vacation," Quittel says. "They start speaking in whispers." (Winstead "asked on short order for a day off for 'family business.' " He says that's when his manager knew he was gone.)
- If the office slob suddenly discovers pressed slacks and sport coats. (If you're lucky, it's an affair. But it's probably a headhunter.)
- Lack of participation. "If someone who's always been participative withdraws, doesn't volunteer to work on a project," that's a danger signal, Christensen says. This passivity may take the form of agreeing with statements that previously would have launched a flame war.
- Experts also say employees who express new interest in projects' time frames bear watching. They may be leery of long commitments because they suspect they won't be around to see them through.

Remember Winstead, who says he grew less grating once he'd decided to leave? Previously, he was an office agitator. His boss didn't pick up on his shift in demeanor until it was too late.

That's an important point, according to John Putzier, president of FirStep Inc., a Prospect, Pa., human resources consultancy. "Voiced dissatisfaction typically comes first," Putzier says. "This is the early warning sign managers should seize on, because the worker's unhappiness can be channeled into constructive change."

Here's the problem, though: Most IT managers ignore this voiced dissatisfaction, hoping it will go away. Why? Because it's easier to ignore it and avoid a confrontation. Managers convince themselves that the employee will get over whatever his problem is.

But you ought to face the music and talk to the employee about his unhappiness, Putzier says. If you don't, the dissatisfaction turns into apathy. Note the way this apathy completes the vicious circle: The worker no longer seems unhappy. The manager convinces himself he was right — the problem *did* go away.

Uh-uh. It's the employee who's getting ready to go away. That apathy is the manager's worst nightmare — an advanced sign that the employee has mentally checked out. "It's only a matter of time," Putzier says.

Too many managers ignore early signals that workers are itchy. If you let such a situation fester, you can expect another behavior change. But it's probably too late to do anything about it.

Note that both Winstead and Thornburg describe passive feelings and behavior once the dic was cast. They were "sad," they "didn't give too much care," they were "disappointed." That's the apathy Putzier describes.

Before they jump ship, IT workers may try to "rally people around their perception" that the company or their boss is no good, Putzier says. Misery loves company: Such workers are "trying to find other malcontents or potential malcontents," he says.

If they succeed, watch out. One engineer who requested anonymity helped build a computer retailer's training center. He was rewarded with a move to the retailer's fledgling corporate division. But "the company applied a retail mind-set to engineers," the source says. Bad feelings snowballed. Upshot: As a group, a team of 11 folks walked out on the same day.

What to Do

So what do you do when you suspect, but don't know for sure, that an employee has The Grass Is Greener Over There Disease? Your best bet is to nip turnover in the bud in all the usual ways. Communicate. Spread the glamour projects around. Help workers upgrade their technical skills. Make sure your compensation package is competitive in your industry. And keep this chilling quote from Putzier in mind: "If you look at the reasons for turnover, they're almost all a variation on 'My boss is a jerk.' The jerk bosses want to assume it's about money — because that gets them off the hook." ◗

Ulfelder (ulfelder@earthlink.net) is a freelance writer in Southboro, Mass.

> If you're not getting people up to speed in different technologies, you're going to lose them.
>
> FRAN QUITTEL, HIGH-TECH CAREER EXPERT AND *COMPUTERWORLD* COLUMNIST

Parting Lessons

Even if you do everything right, people will think about leaving. What you do about these mullers depends on whether they're in the early or late planning stages. Here's some advice from analysts, managers and programmers:

The catchables. If an unhappy worker has been slogging away at unexciting projects, reassign him to something sexy with a high profile – even if he requested the projects he's on now. "I should have been given much more responsibility, but I was being passed over . . . again and again," says programmer/analyst Mark Winstead of a job he left.

Also, "ask [dissatisfied workers] for a six-month commitment," says Fran Quittel, a high-tech career expert.

To what? "To anything. Try to get them to invest themselves in *something*," she says.

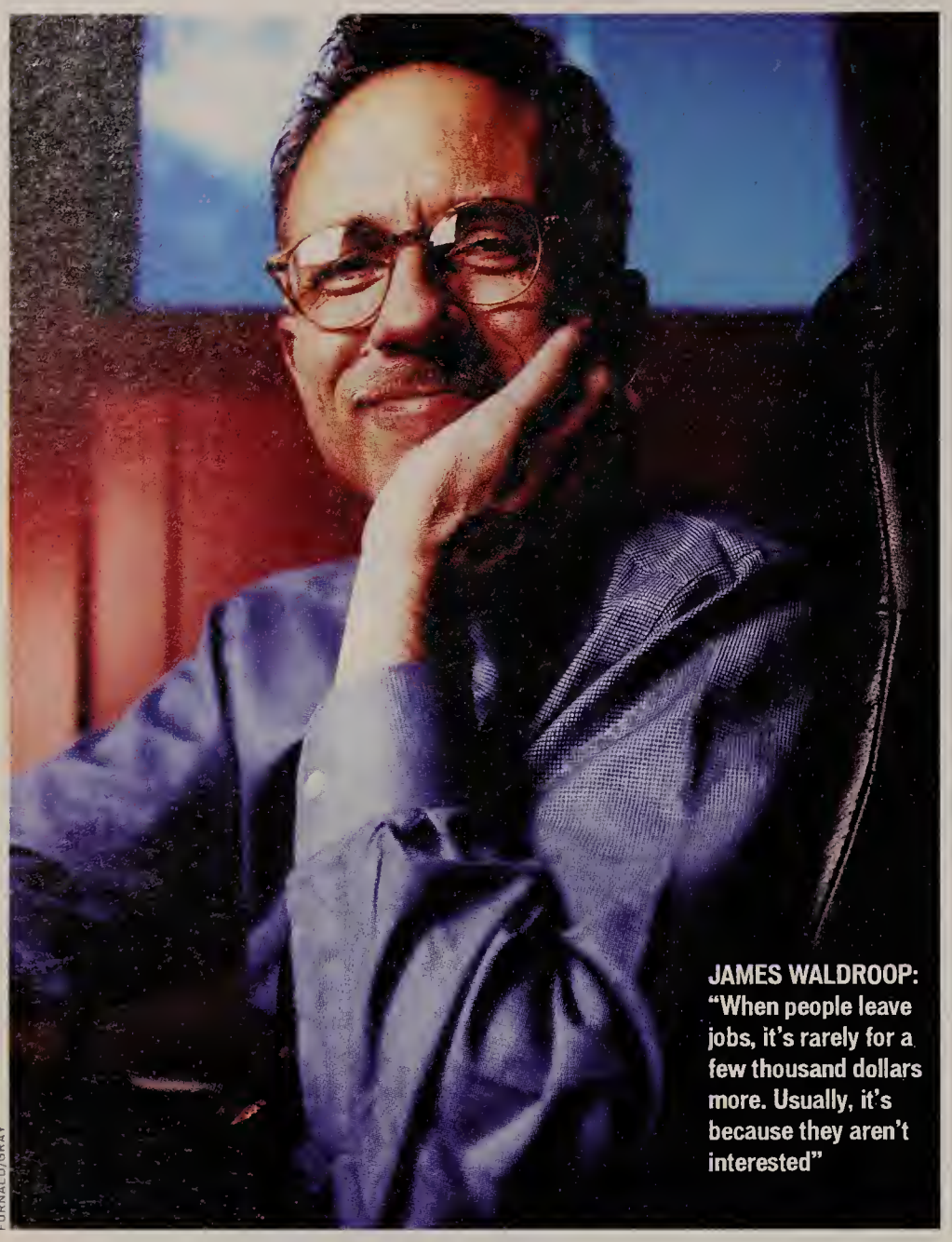
If your business is doing badly and there's widespread unrest, set up "truth vehicles" such as open-book management, suggestion boxes and open meetings, says John Putzier, president of FirStep. "The more open the organization is," he explains, "the less potential for the grapevine."

Putzier also says it's important to "grab voiced dissatisfaction and act on it." The key question to ask the departing worker: "What would you do differently?"

Department of barn-door locking. If someone's just punching the clock waiting for a new job to come along, you may be tempted to confront him. But Quittel says that isn't necessarily a good idea. "You have to assume that if you confront someone directly, they won't tell you the truth," she says.

Experts stress the importance of exit interviewing as a way to find out why people are leaving. If you find a pattern – lousy pay, a few bad managers – you must address the issue.

Finally, no matter how betrayed a departure makes you feel, project a different image. "Even if we're really angry someone's left, we try to make them feel good," says Jack Morgan, assistant vice president of human resources at CSX Technology Inc. in Jacksonville, Fla. CSX has several innovative retention programs, including "alumni" parties where the company tries to lure back former IT workers. "You want [former employees] to feel good and say good things about you," Morgan says, if only for pragmatic reasons. "Referrals are vital." – *Steve Ulfelder*



JAMES WALDROOP: "When people leave jobs, it's rarely for a few thousand dollars more. Usually, it's because they aren't interested"

FURNALD/GRAY

Keeping Your Star Performers

Why does a star performer up and leave the company? **James Waldroop** *says it isn't usually for money or any of the other reasons typically given but rather because the job doesn't tie into what makes the star happy.*

The manager must help people discover what that is and sculpt a position that allows its expression, says Waldroop, co-author with Tim Butler of "Job Sculpting: The Art of Retaining Your Best People," which appeared in the September/October issue of Harvard Business Review. *Waldroop, associate director of career development at Harvard Business School and principal of Peregrine Partners, a career development firm in Brookline, Mass., talked about job sculpting with* Computerworld *senior editor Kathleen Melymuka.*

You say it isn't safe to assume that people who excel at their work are happy in their jobs. Why not? I'm pretty good at changing tires, and if you paid me enough I could really turn that lug wrench, but would I be happy? No.

People in the engineering and technology field were often counseled in that direction because they're good at math and science, and they went. It was easy and it was a good job. But they never liked it.

And that's where deeply embedded life interests come into the picture. Can you explain what that means? By deeply embedded life interests, I'm not talking about passing fancies like collecting gold coins. I'm talking about interests in the core activities of doing business. By the time people reach early adulthood, their interest patterns are set for life. We've identified eight broad, core functions that apply to a variety of work. [See box below.] People generally have two or three. In that combination of interests, you can find the right path.

Can you give me some examples of how you can help an employee align his life interests with his career? Take somebody interested in application of technology and creative production and we might be talking about Web design or working for George Lucas [on computer effects for movies] — technical but creative. But if you fold in managing people, then we're talking about a different animal: somebody who might like managing that group. Then somebody who likes to influence through language and ideas wants to be closer to the customer: a product manager who really thinks about how to get people to buy this thing. The person who likes enterprise control wants to be running the show — maybe starting the business or taking it over — managing from a strategic point of view.

What happens when someone's job doesn't nurture his life interests? There are some life interests that you can express outside work. Someone with a desire to mentor might become a Big Brother, for example. But many people will be miserable and will eventually quit without realizing why they're quitting.

So people may not know what their life interests are? Not necessarily, and they make career missteps as a result. They go from Company A to Company B, and they still aren't expressing their life interest because they're doing the same old thing.

How can a manager help? When an individual says he's tired and burned out, a manager can help him figure this out and fine-tune the work rather than lose the person.

Example? You've got an engineer who is interested in counseling and mentoring, but he's spending [all of his time] in front of a terminal. Maybe this person can set up a mentoring program for new hires. If he's also interested in influencing through language and ideas, he might be sent out on the road periodically to do recruiting.

Let's say there's an interest in influencing through language and ideas, but not in mentoring. That person might stay in the engineering role, but also work as liaison between his group and the sales and support folks. If he's really into creative production, he could work with the people who write the manuals.

So you can make fairly minor changes or start with small changes that will evolve over time? Absolutely. But they can also be major changes. If somebody really ought to be moved into something different, move him.

How can I incorporate this kind of thinking at my company? As an individual manager, you can use this as a model and say, "Look at this list and tell me what you think you are." But that's a suboptimal approach, because it communicates that the manager cares but not that the entire organization does. And a manager doesn't know enough about all the jobs in the company and what their activities are to be able to split a person's time 80-20 [ratio between two functions] or whatever it takes.

If there's an organizational commitment, you make the decision that this is really something you want to put energy into, and you sell it to your employees as something that will help them find the right place to make their career interesting and useful. You have no idea what a competitive advantage that is when recruiting.

How do you know this works? We have no hard data; the tools and concept haven't been around long enough for that. But our experience is absolutely consistent that when people are able to mold their jobs to fit them a little bit better, they stay. ◗

The Eight Core Life Interests

- Application of technology
- Quantitative analysis
- Theoretical development and conceptual thinking
- Creative production
- Counseling and mentoring
- Managing people and relationships
- Enterprise control
- Influencing through language and ideas

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THE BEST JOBS

COMPUTERWORLD'S 1st Quarter HIRING SURVEY

E-commerce continues to dominate new IT hiring; meanwhile, demand for contractors is dropping fast. By Sharon Watson

PICK AN IT JOB — any IT job — and no matter what the actual title is, chances are very good it's woven into the Web in one way or another. According to leading information technology recruiters, all the hot jobs they expect to fill this quarter are being driven by electronic business and its demands, including the usual suspects like Web applications development and less-obvious ones like Unix network administration.

"Web and e-commerce projects are pivotal to generating revenues and reducing costs, so everyone wants to get theirs done faster and better," says Alan Fiermonte, vice president of business development at ReviewNet Corp., a recruiting firm in Philadelphia.

That demand and need for speed makes this a candidate's job market, with fierce competition for applicants skilled in any of today's hot technologies, from Java to Unix to Oracle, as well as those technologies that are just starting to simmer, such as e-commerce development platforms like San Diego-based Miva Corp.'s Miva Empresa.

Most job openings are new ones that have been created by the electronic-business surge, though losing talent to competitors does open some positions. That's just one of the realities that companies recruiting IT talent must face, say recruiters.

The fact is, many IT professionals want to work with hot technologies. If old-line companies can't

offer leading-edge projects, dot-coms may lure away talent with their promises of fortunes driven by initial public offerings. Many recruiters in hot markets like New York and the West Coast say they've seen candidates walk away from high five-figure salaries plus benefits in favor of two-thirds as much money and a fistful of stock options.

Additionally, many employers lose good talent because it takes them too long to make an offer, say recruiters. "There's no time for two or three interviews," says Judy Karpel, a partner at New York-based IT recruiting firm Hayward Simone Associates Inc. "Good people get lots of interviews and are off the market very quickly."

Though IT professionals do seem to be sitting in the catbird seat, recruiters caution them on several fronts. First, employers want people with proven skills, so experience does count. Next, recruiters say, IT professionals need to stay current with new Web technologies, which seem to emerge every month. "Make sure you're learning the skills that will be hot six months from now," says Ilya Talman, president of Roy Talman & Associates, a Chicago-based IT recruitment firm.

Such skills may include the XML content-tagging language, as well as Java, Extensible Table Markup Language, Miva Empresa and Personal Home Page, a server-side scripting language.

Also, because electronic business requires IT staff to work closely with customers inside and outside a company, communication skills are more critical than ever, say recruiters. "Even hard-core developers are being exposed to customers today," Karpel says.

So for IT people with the right skills and experience, the following positions are the ones IT recruiters say will be hot this quarter:

1 E-Commerce Project Manager

Responsibilities: Develop and lead e-commerce strategy; act as a liaison among senior management, IT project teams and internal and external clients. Also generate ideas for Web content and tools, define business requirements and lead technical teams to implement strategy.

Salary: $105,000 to $110,000

Qualifications:

- An extensive IT background, with an emphasis on e-commerce consulting and/or experience with application development.
- Project leadership skills.
- Demonstrated experience in the employer's specific industry.

Advice to hiring managers: Ask e-commerce gurus for evidence of their successes elsewhere, recommends Bob Otis, vice president of advanced technologies at Atlantic Research Technologies, a Stamford, Conn.-based search firm.

Advice to candidates: "Before taking the job, make certain you understand the employer's e-commerce vision," says Otis, noting that not all firms have the will to transform themselves into electronic businesses.

2 Web/E-Commerce Applications Developer

Responsibilities: Create intranet- and Internet-based applications, with increasing emphasis on e-commerce applications. Also integrate new applications with existing internal applications such as enterprise resource programs, databases and data warehouses.

Continued on page 48

IT Hiring Projections by Major Industry

INDUSTRY	Number of companies surveyed	Average number of IT staff	Three-month staff hiring projection	Average number of IT temps	Three-month temp hiring projection
Business services	33	99	+7%	6	-8%
Insurance/real estate/financial	198	302	+6%	33	-6%
Publishing	34	52	+6%	7	-16%
Value-added resellers	112	3,279	+5%	1,270	+15%
Software development	156	901	+5%	115	+8%
Wholesale/retail	98	234	+4%	33	-7%
Computer manufacturers	56	774	+3%	34	+3%
Banking	69	401	+3%	39	-7%
Transportation	133	1,802	0%	80	-7%
State and local government	129	118	-1%	11	-4%
Health care/medical services	133	177	-2%	59	-22%
Manufacturing	316	136	-3%	63	-9%
Education	183	206	-4%	36	+7%
Mining/petroleum/construction	62	108	-5%	23	-7%
Federal government and military	116	1,593	-7%	67	-9%

IT Hiring Projections by Region

REGION (states)	Number of companies surveyed	Average number of IT staff	Three-month staff hiring projection	Average number of IT temps	Three-month temp hiring projection
New England (Conn., Mass., Maine, N.H., R.I., Vt.)	139	806	+4%	14	-10%
Mid Atlantic (N.J., N.Y., Pa.)	309	683	+2%	322	-3%
Pacific (Alaska, Calif., Hawaii, Ore., Wash.)	249	1,437	0%	233	-3%
East North Central (Ill., Ind., Mich., Ohio, Wis.)	351	559	0%	96	-9%
West South Central (Ark., La., Texas)	145	313	0%	64	-5%
South Atlantic (Del., D.C., Fla., Ga., Md., N.C., S.C., Va., W.Va.)	390	548	-1%	69	-2%
East South Central (Ala., Ky., Miss., Tenn.)	88	1,224	-2%	12	-4%
West North Central (Iowa, Kan., Minn., Mo., Neb., N.D., S.D.)	130	175	-12%	101	-22%
Mountain (Ariz., Colo., Idaho, Mont., Nev., N.M., Okla., Utah, Wyo.)	98	379	-13%	119	-9%
Total/overall change	1,899	—	-2%	—	-7%

Methodology

National Survey of IT Leaders

Computerworld's National Survey of IT Leaders is mailed to more than 4,000 IT professionals each month. The survey asks about IT budgets, current IT head count, hiring needs and the importance of a number of technologies over time. Respondents are asked about their current permanent and temporary IT head counts, as well as their anticipated head counts in three months. The data presented here represents the responses of 1,899 organizations in the U.S.

THE BEST JOBS

Continued from page 47

Salary: Varies with responsibilities, experience and skills, from $65,000 to $130,000
Qualifications:
- Experience in one or more of the following: Active Server Pages, ColdFusion, InterDev, Java, JavaScript, XML, Visual Basic, VBScript, Common Object Request Broker Architecture, Component Object Model/Distributed Component Object Model, C++ and Perl.
- Experience with e-commerce tools such as One-To-One, PureEcommerce, Blue Martini, Site Server, Vignette and Webridge.
- Previous high-traffic e-commerce Web site design and construction.
- Knowledge of Windows and Unix, as well as distributed computing environments.
- Knowledge of relational databases such as Oracle, SQL and Informix.

Advice to hiring managers: Don't get hung up on experience. "Some people with less experience have more talent than veterans," says Danny McKinny, a vice president at J. D. Resources Inc. in Memphis.
Advice to candidates: Know the difference between "exposure to" and "experience with" programming tools, says Alesha Duggins, a vice president at Diamond Star Technologies Inc., an IT recruiting firm in Orange County, Calif. "Until you show you've used it in a real-world corporate environment, it's not experience."

3 Senior Unix Network Administrator

Responsibilities: Administration, planning, design, coordination and control of Unix environments.
Salary: $75,000 to $110,000
Qualifications:
- Five or more years' experience in large enterprise Unix environments, especially Sun Solaris and HP-UX.
- Strong scripting skills.
- Knowledge of Oracle and other relational databases.
- TCP/IP knowledge and experience with e-commerce platforms like BroadVision.
- Good management and communication skills.
- Experience with security a plus.

Advice to hiring managers: "There's a high demand, but they're difficult to locate because they prefer to work on a contract basis," says Sarah Mino, director of eSearch at LeadersOnline Inc. in Irvine, Calif.
Advice to candidates: Unix administrators with strong security backgrounds can increase their salary demands, recruiters say.

4 Senior Database Administrator

Responsibilities: Design and develop the logical and physical layers of various databases; manage database distribution, security and access requirements; oversee performance monitoring and tuning; manage upgrades, maintenance and user support; handle testing, reporting, backup and restore.
Salary: $75,000 to $130,000
Qualifications:
- Oracle experience is very hot, but SQL, Sybase and Informix administrators also are in demand.
- Experience with Active Server Pages, Common Gateway Interface, Visual InterDev, Java and object-oriented programming.
- Experience with Windows NT and Unix.

Advice to hiring managers: "There's no talent available on the Oracle database side," warns Morris Green, a partner at Hayward Simone Associates. He and other recruiters say Oracle database administrators and most other types of database administrators can command hefty salaries — and dot-coms want them, too, and are dangling stock options to get them.
Advice to candidates: Recruiters say adding e-commerce skills to your portfolio will take you to the high end of the salary bracket.

5 Data Warehouse Architects/Developers

Responsibilities: Design and development of data warehouses, including evaluation and specification of networking, hardware, software, applications, middleware and extract, transfer and load tools.
Salary: $100,000 to $150,000
Qualifications:
- Online Analytical Processing and Relational Online Analytical Processing experience.
- Experience with Open Database Connectivity tools, as well as with data mining and modeling tools.
- Experience with SQL, Oracle, DB2 and other relational databases.

Advice to hiring managers: Competition is very tight in this area, and salaries scale accordingly.
Advice to candidates: Companies seem to be settling into their database platforms, so skills in one product might not be seen as easily transferable to another, says Fiermonte.

6 Sales Engineer

Responsibilities: Provide technical expertise in layman's terms during the sales process; supply hands-on technical skills during the implementation process; serve as a liaison between the customer and technical staff.
Salary: $75,000 to $140,000 base
Qualifications:
- Technical skills vary, ranging from networking expertise to programming languages.
- Strong communication skills, especially in delivering presentations.

Advice to hiring managers: It's tough to find this combination of skills in one candidate; at least one client has split the job into two, says Joe Hauser, president of Montvale, N.J.-based IT recruiting firm Search EDP Inc.
Advice to candidates: "You've got to be technical but also business-savvy," says Karpel.

Watson is a freelance writer in Chicago.

There's no time for two or three interviews. Good people get lots of interviews and are off the market very quickly.

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Just-in-Time Learning

BY MONICA SAMBATARO

IN A RAPIDLY CHANGING business environment where information can quickly become obsolete, staying on top of training can be a mountainous task.

Rather than having employees take time away from work to sit through traditional classroom courses, many companies are using technology-based, self-guided tutorials and databases that allow users to focus on "nuggets" of information as needed to perform specific tasks and solve problems as they crop up.

The mind-set of just-in-time learning is: "As soon as I have this little piece [of information], I'm out of here," explains Heinrich Koenen, vice president and dean of The Masie Center, a learning and technology think tank in Saratoga Springs, N.Y.

Just-in-time learning incorporates Web- and intranet-based applications as well as CD-ROMs, satellite channels and videotapes.

Companies save travel and education costs. And workers like the just-in-time approach because they can train at their own pace, wherever and whenever they like.

Users can customize their training to fit their needs and engage in online collaborative learning communities, where they can exchange experiences and access the latest opinions from around the world.

DEFINITION

Just-in-time learning systems deliver training to workers when and where they need it. Rather than sitting through hours of traditional classroom training, users can tap into Web-based tutorials, interactive CD-ROMs and other tools to zero in on just the information they need to solve problems, perform specific tasks or quickly update their skills.

Various Just-in-Time Learning Delivery Methods

Just-in-time learning can be delivered in a variety of ways, depending on a company's training budget, technology base and the type of training needed. Here are some of the benefits and drawbacks to various delivery methods:

	PROS	CONS
Web- and intranet-based applications	Accessible anytime, from any PC Easy to update or add information Offers interactivity and feedback	Limited multimedia capabilities A lot of Web training is still text-intensive; not as engaging as some other methods
CD-ROMs	Accessible anytime, from any PC Provide multimedia, highly interactive and engaging experiences	Information is limited to what was recorded on disc Expensive to update and redistribute No feedback
Satellite channels	Easy to update information Engaging content	Receiver must be set up for access No interactivity or feedback
Videotapes	Engaging content	Not as accessible as PC-based applications Expensive to update or redistribute No interactivity or feedback

At Your Fingertips

Electronic learning is big at IBM. Last year, the company saved $200 million in internal training costs related to traditional training sessions and time away from work, according to Rick Horton, general manager of IBM Global Services' Learning Services group.

IBM provides its 6,000 business partners with 10 satellite channels of partner and product information. The system was set up because IBM partners said they weren't getting information fast enough to sell IBM products, says Horton.

Satellite receivers can be installed at any location, and for $1,500 per year, users get access to the most recent product-specific news and partner-related announcements. IBM also set up a Web-based application to supplement the satellite system.

Another initiative, called Sales Compass, a Web-based application that gives IBM salespeople the latest information about their customers prior to making sales calls, helps salespeople make effective pitches, says Horton.

Analysts and corporate leaders say electronic learning is mushrooming. According to Framingham, Mass.-based International Data Corp. (IDC), the market topped $1 billion last year and is expected to grow to $11.4 billion in 2003.

Cost savings is one factor fueling this growth. Cushing Anderson, an IDC analyst, says one day of classroom training typically costs $500 to $1,200, while one day of electronic learning runs from $100 to $500.

There are also big savings in increased productivity and efficiency. Online training cuts time by letting users grab only the chunks of information they need from the convenience of their desks.

Just-in-time learning is also helping IT staffers keep up with changes in technology. "IT training is essentially perishable," says Anderson. The just-in-time approach allows IT workers to update their skills continually, whereas the knowledge gained from classroom training can quickly become obsolete, he says.

Just-in-time learning isn't just for in-house training and support. Some companies use it as a customer service tool.

Charles Schwab & Co.'s electronic brokerage unit launched an interactive Web-based learning center in December to provide free investment education to prospective and existing customers.

Although the brokerage expects that a reduction in customer information requests will cut costs, "that wasn't the driver," says Janet Lecuyer, vice president of electronic learning at Schwab's electronic brokerage unit.

Educating customers reduces their fears about investing and "moves them along in making a decision to invest," she explains.

Schwab's online learning center, which offers courses in the fundamentals of investing and will later offer material for more advanced investors, was set up so customers can go through an entire course sequentially or choose only topics of interest.

The learning center was designed to be convenient to use, because customers said they "didn't have time to commit to a specific curriculum," Lecuyer notes. "They wanted to be in control."

Striking a Balance

Just-in-time learning is particularly useful in the IT world, says Anderson.

"IT lends itself to [just-in-time] learning," because this type of training is often very step-based, he says. And IT trainees are more comfortable with online delivery methods than others might be, he adds.

But just-in-time learning has limitations. Most analysts and users say it won't replace classroom instruction altogether.

Sue Goldberg, president of Northeast Training Group Inc. in Chestnut Hill, Mass., says just-in-time learning works only up to a point. Most studies, she explains, indicate that instructor-led training is still the best way to learn.

The idea that just-in-time learning will replace classroom instruction is "baloney," says Anderson. Corporate training, he says, will eventually evolve into a mix of delivery methods.

"You have to offer a range," says Anderson. "The delivery vehicle will always depend on the content."

Sambataro is a freelance writer in Salem, N.H. Contact her at monica_sambataro@computerworld.com.

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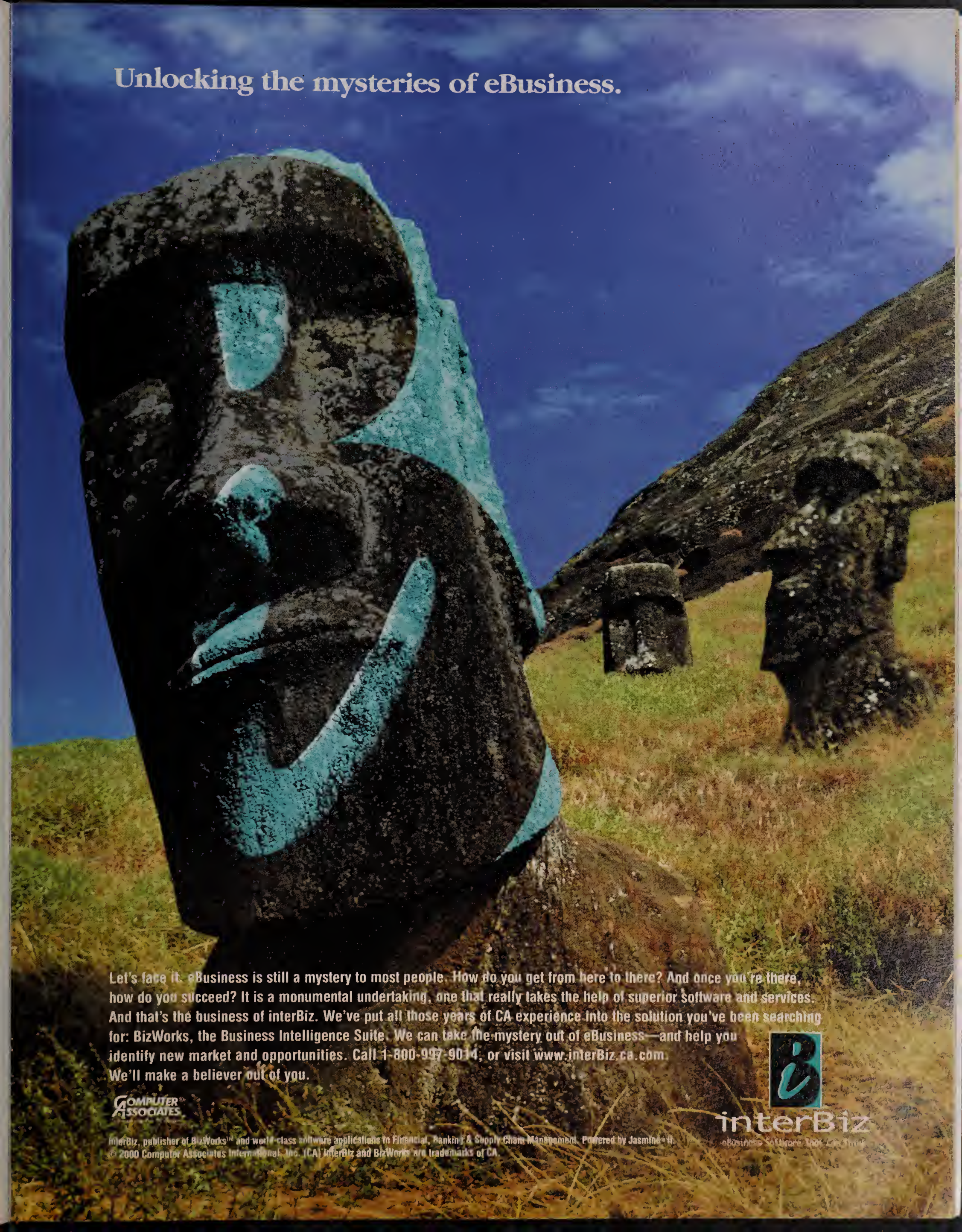
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JOE AUER/DRIVING THE DEAL

Creating 'zones of consideration'

WE OFTEN HAVE THE ABILITY to generate significant negotiation power to achieve our objectives in any deal for a product or service. By creating a "zone of consideration" to evaluate and negotiate with more than one qualified supplier, we can leverage our control of the process. But too many times we give away our power before negotiations even begin.

All too often, a scenario like the following occurs: A large bank I'm familiar with always seeks the best deal for its ongoing IT procurement function.

Normally, the bank performs an initial evaluation, narrows the field of potential suppliers, then solicits a "best and final" offer from each. After further evaluation, one offer is selected. The bank then notifies the selected supplier that it has won the contract, tells competing suppliers a deal has been made and arranges to negotiate the contract.

But recently, after being told that its "best and final" offer had been selected, the supplier raised new issues it wanted to negotiate before signing a contract. Because the bank had sent away all other potential suppliers, it lost its leverage. The selected supplier no longer had to worry about competing for the contract. As a result, it had no incentive to move quickly to finalize a user-friendly deal.

To make matters worse, the bank needed the products quickly. The selected supplier used this as leverage to get the contract signed. It had to do little more than wait, while the bank was faced with forking over more money to ensure timely delivery. Ultimately, the supplier got an additional fee from the bank, a fee that became an issue only *after* the bank's selection of the supplier's best and final offer.

You can reduce the risk for this type of problem by conducting negotiations with competing suppliers through a zone of consideration.

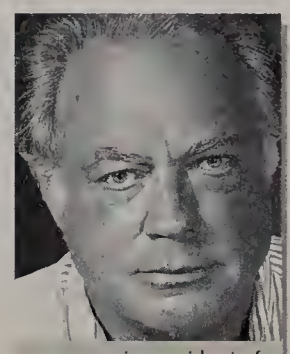
After an initial evaluation of offers, identify a small group of suppliers whose offers are most qualified. Then advise them that they've been selected, along with a few competitors, for further evaluation and negotiations through your zone of consideration.

It's critical that all suppliers understand the following points:

- You will negotiate with each of them, based on their most recent offers, until you award *and sign* a contract with one.
- Your evaluations of all qualified suppliers will continue throughout your concurrent negotiations. (Incidentally, you will learn incredible new things about some suppliers during negotiations that sometimes can actually change your opinion of them from a "must have" to a "never, ever.")
- You may choose at any time to discontinue negotiations with any potential supplier. Provided that you have negotiated all outstanding issues with a supplier, you can simply select that supplier immediately, without giving any other competing suppliers a last chance or a deal to beat (unless the selected supplier fails to promptly execute your contract). When suppliers know they will not get a "last look" or a "deal to beat," they get very serious about getting their best deal on the table quickly, because they fear they won't get another shot.
- In light of these facts, admonish suppliers in the zone to make absolutely certain that they have their best current offer on the table *at all times*, because that may be their last chance.

The zone of consideration provides a framework for you to assume control over the timing and power in the negotiations. Maintaining the zone until a contract is actually signed with the selected supplier can reduce the chances that the supplier can gain further concessions by raising new last-minute issues.

What's more, you should complete contract negotiations *prior to selection*, since their willingness to provide a good contract should be one of your major considerations. Maybe just as important, the suppliers have an incentive to get you a great deal quickly, before another supplier snatches your business. This sure beats an arrogant selected supplier who gives you only pillow talk while you run out of time and fall into its hands like an overripe plum! ◗



JOE AUER is president of International Computer Negotiations Inc. (*www.dobetterdeals.com*), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High-Tech Acquisition Professionals. Contact him at **joea@dobetterdeals.com**.

BRIEFS

Order Management

QAD Inc. in Carpinteria, Calif., this week plans to release the first pieces of a promised new line of business-to-business order-management applications for manufacturers. The first version of the Java-based eQ software was designed to manage Internet sales and inventory replenishment. Modules for online procurement and other tasks will be added later this year. The applications will work with multiple enterprise resource planning systems, not just QAD's own back-office software. Pricing starts at $185,000.

Online Sales Coach

Ockham Technologies Inc., a start-up that makes sales management software, this week plans to launch a Web site that sales executives can use to get information on management techniques and to benchmark their company's performance against industry averages. The site (*salesmanagement.com*) is free to registered users, but Atlanta-based Ockham plans to add fee-based services such as recruiting help and computer-based training courses this summer.

Web Markets

PeopleSoft Inc. in Pleasanton, Calif., last week said it plans to use Walnut Creek, Calif.-based Commerce One Inc.'s MarketSite trading exchange software in a new service offering – designing and building online marketplaces by contract. PeopleSoft also plans to launch its own exchange to sell products from online catalogs included in the Commerce One software.

Oracle Data in Hand

BPA Systems Inc. in Austin, Texas, last week announced application server software that lets users download information stored in Oracle Corp. databases to cellular phones and other wireless devices via the Web. Pricing starts at $100 per end user plus a 20% annual maintenance fee.

Net Ads to Pass TV

A new study predicts that more advertising dollars will flow to the Internet than to television in the next five years. The Myers Group LLC, an Endicott, N.Y.-based economic research firm that has been tracking media spending for 20 years, predicted last week that U.S. online advertising expenditures will increase from $4.32 billion this year to $32.5 billion in 2005. U.S. television ad money will increase from $16.8 billion to $19.2 billion over the same period, according to the Myers report.

A January report from Jupiter Communications Inc., a New York-based market research firm, also forecast significant Internet advertising growth. However, that report set the figure at a much smaller amount of $11.5 billion by 2003.

Datapoints

■ Going Mobile
There may be as many as 1 billion Internet access devices active in the U.S. by 2003. The number of U.S. mobile Internet service subscribers may also reach as many as 4 million by the end of this year. *Source: The Yankee Group, Boston*

■ B-to-C or B-to-B: That Is the Question
According to a survey of companies with at least $100 million in annual revenue, 77% viewed online marketing as their top e-commerce priority, while only 32% had invested in supplier management. *Source: Meta Group Inc., Stamford, Conn.*

■ Internet Anxieties
About 85% of Internet users surveyed in a recent poll said privacy was their main concern regarding the Internet. Only 19% expressed any worries about Internet taxation. *Source: Nua Ltd., Dublin*

■ Online Shopping is Golden
Shoppers in California spent $5.9 billion at e-commerce sites last year, the most of any state. Texans were the next biggest online spenders, at $3.2 billion. *Source: International Data Group, Framingham, Mass.*

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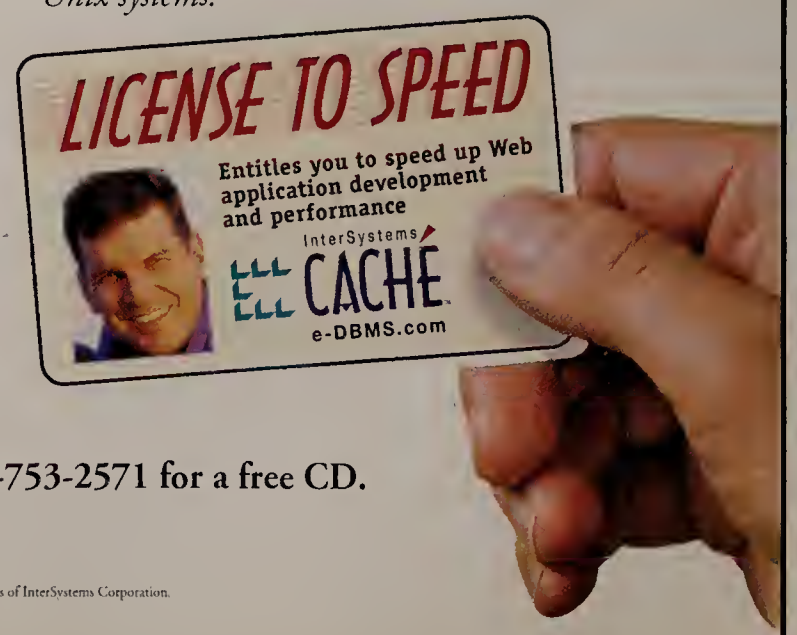

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TECHNOLOGY

WIRELESS WARNING

After finding three security problems involving password and credit-card protection with wireless phone purchases from the Amazon.com Web site, Gartner analysts suggest that corporate IT departments be alerted to similar problems when they set up phones for data or e-mail access. ▸ 56

DOWN ON THE FARM

First there were glass-house mainframes, then distributed workgroup servers. Now some say the headaches of both are combined into centrally managed server farms. Four brief case studies demonstrate that managing server farms can be a much more complex task than running a mainframe data center ever was. But good IT people are making it work. ▸ 68

TESTING, TESTING

Amid the rush to quickly develop and deploy applications for the Web, vendors selling application components are also offering testing services to pick up structural design flaws in applications minted from prebuilt components. ▸ 58

SECURITY JOURNAL

In Week 4 of the security manager's journal, "Pat" finds he's no longer everybody's friend now that he's trying to set and enforce security policies. He has support from his boss on modem pooling, but defers actions on passwords. ▸ 60

EMERGING COMPANIES

It's a great idea: Upload presentations, large financial reports and graphics files just once to Click2send.com Inc.'s online storage vaults, then let recipients view and download the files securely. But can this start-up convert a now-free service into a moneymaker? ▸ 72

HANDS ON

Reviews editor Russell Kay installs Linux on his home machine and lives to tell about it. After that, it's back to Microsoft land for a dynamite new mapping application. ▸ 61

QUICKSTUDY

A tutorial on cache memory, which boosts a computer's performance by keeping the most frequently used data and instructions physically close to the processor, where they can be retrieved more quickly. ▸ 62

SKILLS SCOPE

Business-to-business e-commerce is where the hot action is, and e-commerce networking professionals are the folks making it happen. Salaries start at around $90,000 per year, with bonuses and stock options often part of the mix. And future opportunities are virtually unlimited. ▸ 76

MICHAEL TERRANOVA

PAUL KIRK, senior vice president of MIS at United Companies Financial Corp., says Compaq was reluctant to compete with Dell on price when his company was buying new servers

SOME CLOUDS IN COMPAQ'S FUTURE

IN A *COMPUTERWORLD* SURVEY, customers and analysts say Compaq is doing better than it was a year ago, when its CEO was ousted. But challenges for the company remain as it moves to a direct sales model, faces stiff competition from Dell in the U.S. and struggles to serve high-end users it inherited when it acquired Tandem and Digital Equipment Corp.

64

Security Risks Arise With Wireless Apps

Analysts say lack of credit-card, password protection instructive to those writing apps

BY MATT HAMBLEN

BUILDING WIRELESS applications? Analysts warn that using handhelds and smart phones to work wirelessly over the Web can raise some security risks.

Two analysts at Gartner Group Inc. in Stamford, Conn., recently raised three specific security issues, based on using a Sprint PCS Group wireless phone to buy a book from the Amazon.com Inc. Web site. They said the concerns, which involve password and credit-card protection, suggest serious implications for companies moving to provide wireless e-mail access to employees.

Here's what happened: Gartner security analyst John Pescatore borrowed the Sprint PCS phone of colleague Bob Egan in December to find out if it was easy to place an order with Seattle-based Amazon.com. Pescatore contacted the site wirelessly to buy a Harry Potter book.

Pescatore was prompted to enter his Amazon.com user name and password. He was shocked, he said, to see his password appear as he typed it in, rather than have it hidden with a series of Xs, as one might see when typing a password using a PC. Problem 1.

Then, Pescatore was asked if he wanted to buy the book. He said he was surprised that when he clicked a "yes" box, the order was completed without his entering a credit-card number. Even though Pescatore had previously used a credit card at Amazon via a PC, he had specifically decided not to use the trademarked 1-Click easy purchase option. (1-Click allows Amazon users to store a credit-card number and shipping information with Amazon.) Problem 2.

Problem 3 occurred a week later, when Pescatore asked Egan to scroll back in the phone's memory. When he did, Egan found Pescatore's user name and password stored in cache. He ordered another book using Pescatore's credit card, the analysts reported.

Sprint PCS said the practice of showing the password will continue, because the small keyboard and screen would make it too hard for a user to input a password if it were X'd out.

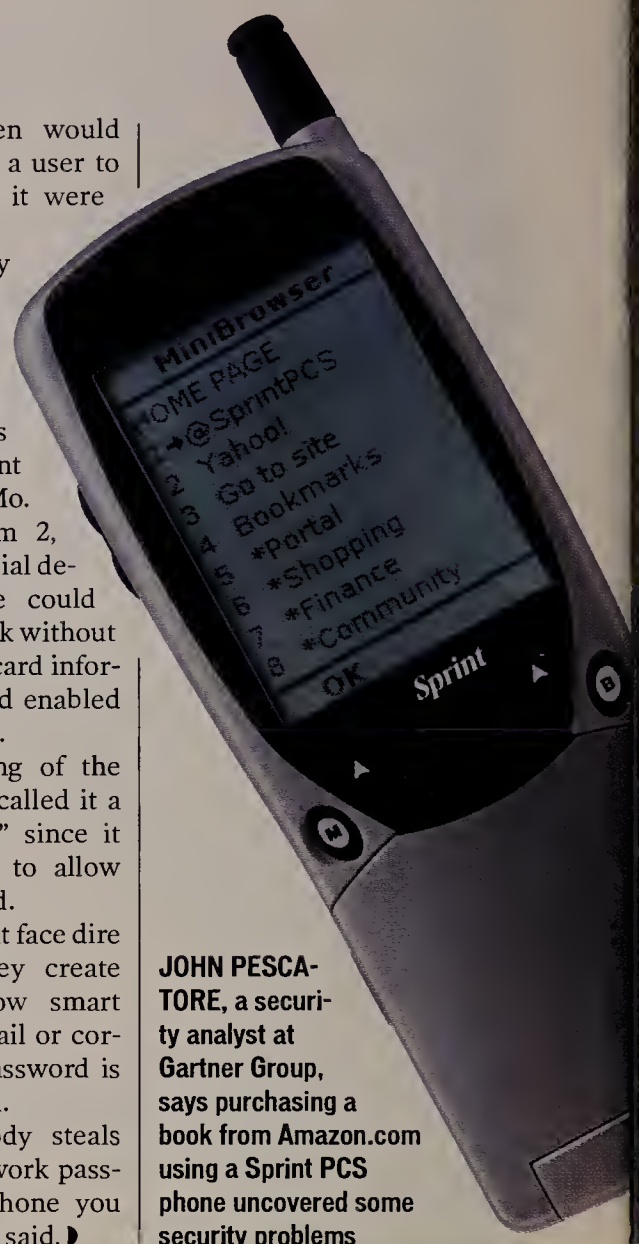
"It's a technology trade-off," said Billy Stephens, director of product management and development for wireless data services at Sprint PCS in Kansas City, Mo.

Regarding Problem 2, an Amazon.com official denied that Pescatore could have ordered the book without inputting the credit-card information unless he had enabled 1-Click in a prior visit.

As for the caching of the password, Stephens called it a "glitch on our part," since it isn't Sprint's policy to allow caching of a password.

Corporations might face dire consequences if they create applications to allow smart phone access to e-mail or corporate data and a password is stolen, Pescatore said.

"What if somebody steals your company's network password from a cell phone you lost in an airport?" he said. ◗



JOHN PESCATORE, a security analyst at Gartner Group, says purchasing a book from Amazon.com using a Sprint PCS phone uncovered some security problems

Correction: Security, Not Data, Tops List

Due to errors in calculation and proofing, a chart and article on information technology buying trends for this year ["IT Spending Trends; Data Is King," Technology, March 27] contained inaccurate information.

The most important buying decisions facing IT managers are actually security, wide-area network infrastructure and enterprise databases, followed by Web-to-database connectivity, desktop replacement systems, Web content-management tools, Web server operating systems, storage-area networks (SAN), high-speed Internet access and Web performance management tools.

The chart also incorrectly listed the order of the criteria that IT managers use in choosing enterprise database, SANs and desktop replacement systems.

A corrected version of the chart appear at right. Full, correct results are also posted at our Web site, *www.computerworld.com*.

Top IT Purchasing Decisions in 2000

The top 10 buying decisions IT managers will make this year

DECISION	
1. Security	7. Web server operating system
2. Wide-area network infrastructure	8. Storage-area networks
3. Enterprise databases	9. High-speed Internet access for telecommuters
4. Web-database connectivity	10. Web performance management tools
5. Desktop replacement systems	
6. Web content management	

What do IT managers look for when choosing a storage-area network?

DECISION	% WHO INCLUDED IN TOP THREE
Speed/performance	24%
Compatibility in an open environment	23%
Scalability	22%
Ease of management	14%
Support for network-attached storage	9%
Adherence to industry standards	8%

What do IT managers consider when investing in an enterprise database?

DECISION	% WHO INCLUDED IN TOP THREE
Performance	20%
Level of integration with legacy systems	18%
Price	13%
Availability of development tools	12%
Level of integration with future systems	12%
Scalability	12%
Availability of administration tools	8%
Extensive platform support	6%

What do IT managers look for when buying desktop replacement systems?

DECISION	% WHO INCLUDED IN TOP THREE
Purchase price	22%
Quality of vendor support	19%
Vendor's reputation for reliability	18%
Long-term total cost of ownership	14%
Easy-to-upgrade components	14%
Remote/network maintenance support	8%
Support for thin-client architectures such as Citrix MetaFrame	4%
Java support	2%
No floppy drive (for security purposes)	1%

Based on an exclusive *Computerworld* survey of 223 IT managers who acquire technology for their organizations. More than one response was allowed; participants were asked to name their three most critical purchasing decisions.

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Firms Test App Components via Web

BY LEE COPELAND

Amid the rush to quickly develop and deploy applications for the Web, vendors that sell application components are also offering testing services to detect structural design flaws in applications minted from prebuilt components.

Components are portions of an application that perform specific functions within the application, such as populating a form with data.

Even though individual components may work fine, they can slow or stop an application if they are combined improperly.

Component-based programming is like building a house of cards: Pull out or add the wrong object, and the whole structure could come tumbling down, says Tracy Corbo, an analyst at Hurwitz Group Inc., a Framingham, Mass.-based consulting and research firm.

Testing Adds Credibility

"Selling components on the Web is relatively easy, but there is more that can be done there," explained Corbo. "Testing is very important for a user's comfort level with using components. It adds an element of credibility for the buyer."

The most important aspect of building component-based applications doesn't involve programming at all, said Corbo, who recommended performing more up-front testing of source code and documenting of the application specification.

"The pitfall of application development programming for the Web is that many developers have not gone back to the basics in application design," Corbo added.

To meet the demands of developers, several online component brokers have expanded their service offerings to include design analysis, tests of code structure and individual component performance and tests of the component's performance as part of the overall system.

Cleveland-based component vendor Flashline.com Inc. recently began offering online quality assurance testing to developers using testing tools from KL Group Inc. in Toronto and Metamata Inc. in Fremont, Calif. Tests start at $50.

Flashline customer Suneet Shah, chief technology officer at Diamelle Inc., an information services and luxury goods company based in Cortlandt Manor, N.Y., operates two Web sites: *www.travelesque.com*, for leisure travel reservations, and *www.diamelle.com*, a diamond and jewelry vendor.

Fast Development

Using Enterprise Java Beans (EJB), Shah and his team of five developers built *travelesque.com* in less than three months. For example, Shah said they used prebuilt EJBs for catalog, search and navigation functionality, cutting the coding task down to writing four or fives lines of reference code to link each component with the Java Native Directory Interface.

"We're using relatively inexpensive PCs — off-the-shelf stuff like Intel machines running Windows NT and SQL server on [the] back end — and [we] wanted to handle very high volume," said Shah. "By doing the load test and quality assurance online, it helps us to maximize performance" on that infrastructure.

Janet Absher, enterprise applications team leader at the U.S. Bureau of the Census in Washington, said she plans to use workflow components to develop collaborative, administrative Notes/Domino applications to handle procurements, asset inventory and budget models. She explained that this step was necessary because this year's census crunch has put her team under more pressure to ensure quality while cutting development time.

"We have a lab environment and full testing capabilities on the development server; it simulates everything, like code looping and populating data," Absher said. However, she said her team would welcome external testing services to improve the performance of applications developed in-house.

"We'll let someone else do the testing, then run the code through some of the paces on our own," Absher said. "We're new to this . . . and are interested in picking up tools and tricks from other folks." ◗

AT A GLANCE

Web-Based Component Testing

Guidelines to follow:

- Start with a good design and overall planning
- Perform load testing to find out if the component can handle the right level of concurrent users
- Use code structure analysis to help determine whether the code will break

SOURCE: *COMPUTERWORLD* INTERVIEWS

SNAPSHOT

ASP Forecast

Worldwide spending on application service providers (ASP) will increase to $8 billion by 2004.

- The **maturity** of ASP offerings, higher **customer awareness**, endorsements by **influential players** and an increase in **customer acquisition** and collaborative segments, including **groupware**, document management, **e-mail** and personal applications, will **spur ASP spending**.

1999	$296M
2004	$7.8B

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS. MARCH 13, 2000

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BRIEFS

Caleb Technology Releases Monster Floppy

Caleb Technology Corp. has rolled out Monster Floppy, a high-capacity drive that stores, reads and retrieves up to 144MB of data. The drive is backward compatible, allowing data files, utilities and applications to be transferred from older disks to Monster Floppy. It's available in packs of five disks for $34.99.

Based in Boulder, Colo., Caleb provides high-capacity floppy-disk drives and media.
www.calebmedia.com

Be Inc. Opens Up Operating System Source Code

Be Inc. last week announced the latest version of its digital media operating system, BeOS 5.0. The Personal Edition of the operating system will be available at no charge via the Web at *http://free.be.com*. In addition, the BeOS 5.0 Pro Edition, a full-featured version designed for media professionals, has been made available to third-party publishers in North and South America and Asia; availability in Europe is soon to follow.

In conjunction with the release of BeOS 5.0, the company has announced that it will offer free access to its source code. The BeOS user interface known as Tracker (the desktop) is available at *www.opentracker.org*, and the source code for the Deskbar (the task bar) is available at *www.opendeskbar.org*.

BeOS 5.0 Pro Edition will be available through Gobe Software Inc. in the Americas and through Hitachi Ltd. in Asia. It's expected to be available in Europe through Koch Media GmbH and Apacabar. Each publisher will price the product independently.
www.be.com

Sprint PCS Offers Dictionary.com for Wireless

Sprint PCS Group in Kansas City, Mo., last week announced the availability of Lexico LLC's Dictionary.com Web site on Sprint PCS wireless Internet phones. The site offers definitions of 135,000 words and translates certain words and phrases into several languages. Access to Dictionary.com is available at no charge to Sprint PCS users who pay a flat monthly fee for the general Web service.
http://csg.sprint.com/pcs

Procom Launches NetForce 1500 Data Server

Procom Technology Inc. in Santa Ana, Calif., has launched NetForce 1500, a midrange data server appliance designed to address the storage requirements of electronic businesses and corporate workgroups. Offering up to 360GB of cross-platform storage capacity, NetForce 1500 is a multiprotocol server appliance that provides cross-platform file sharing and file locking on both the Network File System and Common Internet File System. NetForce 1500 allows servers to share a common storage repository, eliminating the need to replicate data on multiple servers.

The product supports security and remote authentication under both Windows and Unix environments and is available in desk-side and rack-mount configurations.

Pricing for NetForce 1500 ranges from $22,000 to $50,000, depending on the configuration.
www.procom.com

Veritas to Launch Two New Storage Products

Veritas Software Corp. has introduced Remote Storage for Microsoft Exchange, a storage management application that minimizes storage space on Microsoft Corp.'s Exchange servers. Remote Storage automatically moves e-mail message attachments from the Exchange database onto a secondary storage device such as a tape drive or library.

The Mountain View, Calif.-based company has also developed Data Analyzer for Exchange, a tool that was designed to determine how much of a user's Exchange database contains attachments.

Remote Storage and Data Analyzer are both scheduled to ship in the second quarter. Remote Storage will cost $4,995. Pricing information wasn't available for Data Analyzer.
www.veritas.com

IBM Agrees to Resell McData Products

Broomfield, Colo.-based McData Corp. and IBM last week announced a reseller agreement under which IBM will resell McData's ED-5000 Enterprise Fibre Channel Director and management software as part of its Enterprise Storage Area Network.
www.mcdata.com
www.IBM.com/SAN

Imperial Upgrades Solid-State Disk Capacity

Imperial Technology Inc. has boosted the capacity of its 3.5-in. MegaRam-35 solid-state disk. It can be configured to hold 2.1GB of nonvolatile storage and 4.2GB of volatile storage. According to the El Segundo, Calif.-based developer of solid-state disks and cache systems, the nonvolatile disk includes an internal disk and battery unit, which writes data to a backup disk through a battery when the power is removed. Once power is restored, it transfers data back from the disk into solid-state memory.
www.imperialtech.com

Sun Expands Its Remote Management Services

Sun Microsystems Inc. has announced that its network storage products are now supported within Sun Remote Services 2.0, a suite of remote management services. Sun Remote Services monitors customer storage systems, servers, Solaris and applications software. The suite supports the StorEdge and Storage Array lines. Pricing wasn't available.
www.sun.com

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Ditching Modems, Punting on Policy

Week 4: Pat lines up political support for a shift to modem pooling and proposes strict password process

HAVE YOU EVER noticed that people are gung-ho about your new job and give you tons of "atta-boys," until you begin to make policy? Then their attitudes change, and they seem to think, "He was so cool when he was just a network admin." I think the honeymoon is over.

We have more than 120 modems on our campus, and I have set a deadline of May 1 to replace all of them with Shiva dial-out modem pools from Intel Network Systems Inc. in Bedford, Mass., formerly Shiva Corp. This will reduce our exposure to war dialers and the biggest back door to our network, since all outgoing modem connections will pass through a single access point, which we can more easily secure.

Security Manager's Journal

Don't Take My Modem

To begin, I drafted an e-mail to the information technology department, which includes a staff of 70 full-time programmers, notifying them that they would be the first to receive the modem-pooling software. I chose the Shiva Dial-Out Chooser, which uses the dial-out features of our LanRover D56 dial-up access switch.

Well, almost immediately, e-mails started to flood in from the programmers, who said they wanted to run tests to make sure all of their applications would work on the new modem pools. One of their favorite applications is Symantec Corp.'s pcAnywhere, which is a notorious back door because it's designed to make it easier for outsiders to dial in to systems and control them remotely — which, of course, makes it easier for hackers to do the same thing.

I sent the programmers a note explaining that because the help desk was doing the conversion for us and they don't want to make two trips to each workstation, the programmers' modems would be removed and the analog lines disconnected at the same time that the new modem pool software was installed. The e-mails continued to fly. My boss advised me to just ignore them. I must say that he's behind me 100%, and that helps in creating a standard that wasn't there before.

Punting on Passwords

Moving on to another security fiasco, it appears that our corporate password policy is to force passwords to be at least eight characters long and changed every 90 days. But it also appears that the higher you are in the company and the more access you have to critical data, the less restrictive the password policy is. For the big bosses, there is no expiration period and only a four-character length requirement. I believe this began when a bigwig in our company managed to get a shorter password that never expires.

I decided to call a meeting with my boss, since he's been with the company two years longer than I, to discuss the challenges of changing the password policy. He reminded me that if I change the expiration period to 45 days from 90, the help desk is going to get hammered. More than 500 passwords would expire immediately. We also discussed the fact that enforcing a policy in which passwords consist of mixed alphanumeric symbols — not just numbers in front of or behind whole words — is going to be extremely hard. I've tabled the issue, for now.

First, Ask the Lawyers

Next stop was our legal department, to see what I can do to begin implementing corporate policies regarding our network.

The first subject was a release document for our network topography playbook, a binder that will have our entire network diagrammed both physically and logically. It will even include emergency contact numbers so we can be reached in the middle of the night to cut the response time to any event. The challenge is that this is information we want to protect. The legal department and I drafted a document specifying how people must protect this data that I will post later this month when it's approved. The book will be distributed to only 11 people. We want those people to take the security of this information seriously.

The next topic was how to develop a complete set of security policies. I found a great set of sample policies at the Web site for the SANS Institute. It covers almost every policy aspect that we need in our company. The legal department loved it because it gives our company a head start in what needs to be covered.

Demos of the Week

The last meeting of the week was with Network Associates Inc. (NAI) to see a demonstration of CyberCop, a full intrusion-detection system. Just to refresh your memory, I was trying to install Internet Security System Inc.'s (ISS) RealSecure and Network Ice Corp.'s IcePac suite in our lab to test an intrusion-detection system for our internal network.

I found The Network Ice product difficult to install and to use, with a cumbersome Web interface console. I really like it as an intrusion-detection system for the home user, but not for an enterprise. RealSecure is also difficult to install. I invested two days in the lab and still haven't figured it out. And I can't make the time to read the five 100-page manuals.

I was impressed by NAI's CyberCop product demo. It appeared to be very easy to use and configure out of the box because it takes advantage of the Microsoft Management Console (MMC). I will wait and see whether that remains true when I get the product to test on my network.

Then there's the cost. NAI produces great stuff, and the pricing is in line with that of other vendors — maybe even a little less. The quote we got for 50 units was around $10,000, including two years of support.

Next week, I will be in the ISS-sponsored Check Point Software Technologies Ltd. Firewall-1 class for four days. I'm looking forward to it because I need to learn about the virtual private network (VPN) and secure remote/client piece of the software. I have 35 Microsoft Exchange sites I need to connect to our corporate headquarters, and static IP addresses are becoming extremely hard to get outside of the U.S. We're hoping that establishing a VPN will ease that challenge for us. ◗

THIS WEEK'S GLOSSARY

- **Back door:** A secret way of gaining access to a program or online service. Also known as "trapdoor."
- **Firewall:** A system or combination of systems that enforces a boundary between two or more networks. The typical firewall is an inexpensive PC running a variant of Unix.
- **Microsoft Management Console (MMC):** The software vendor's framework for management applications.
- **Modem-pooling software:** Multiple modems serving dial-in or dial-out needs in one location, chassis or unit.
- **Virtual private network:** A wide-area communications network that provides what seems like dedicated lines over what are, in fact, shared lines. This allows a private network to be configured within a public network for greater security.
- **War dialers:** Software used to rapidly dial numbers to find live modems that will allow a connection to be made in order to compromise a system or network.

LINKS:

www.sans.org/newlook/resources/policies/Appdb.doc: Sample security policies from the SANS Institute.

www.pgp.com/asp_set/covert/default.asp: Network Associates' Covert Research Center; includes CyberCop-related links. Find information such as a security overview, alerts, risks and more.

http://shop.symantec.com/cgi-bin/trialware/Core/Core.pl?SECTION=pcANYWHERE&subsite=na&MODE=1&KDATA=KKKK: Information about pcAnywhere.

www.shiva.com/remote/d56/faq.html: Frequently asked questions about LanRover D56 from Intel Network Systems.

www.shiva.com/remote/d56/specs.html: LanRover D56 specifications.

■ *This journal is written by a real security engineer, whose name and employer have been disguised for obvious reasons. It is posted weekly at* www.computerworld.com *and at* www.sans.org *to help you and our security manager — let's call him Pat — better solve your security problems. Contact him with comments or advice at pat_rabbinski@hushmail.com with the subject line Pat's Journal.*

Linux Lives, Microsoft Maps

A Linux installation without pain, and a Microsoft product that shines. Will wonders never cease? By Russell Kay

I'VE BEEN CURIOUS about Linux for a long time, and I've actually received a number of copies of it from various distributors during the past several years. But somehow, it never made it to the top of my project pile.

Last weekend, I took the plunge. I decided to attempt to install Linux on the second hard disk on my home machine. I had three Linux versions on hand — including Mandrake 7.0 from MandrakeSoft Inc. in Altadena, Calif., and TurboLinux Workstation 5.0 from TurboLinux Inc. in Brisbane, Calif. — but I opted to try Corel Linux Deluxe. I chose the version from Corel Corp. in Ottawa for two reasons: First, it came with a Linux version of WordPerfect, an application I've known and used for years; and second, I figured that an applications company might have paid more attention to installation issues.

I started the install process fairly early on a day that I'd left pretty open, prepared for delays by all the horror stories I'd read. Except for an unrelated hardware issue that stemmed from a mixed SCSI-EIDE hard-disk environment, the installation went smoothly. I waited anxiously for the system to lock up or ask me for some obscure technical information about system components that I wouldn't be able to supply.

Didn't happen. It installed, it booted up, it ran. The graphical K Desktop Environment (KDE) that was installed is fairly similar to the Windows graphical user interface, and I was able to navigate it and start up installed applications, including Netscape Navigator and an image-editing program, without fuss and without even opening the manual.

Overall, I was impressed with how simply it went. I've installed just about every version of Windows, from 3.0 on up to 2000 Advanced Server, as well as several versions of Mac OS, and this Linux was smoother than most of those.

Only in a few places did some of the raw underpinnings show through. When I used the file manager, I was greeted with the typical Unix directory structure — */usr/bin/* and the like. But I found that I could avoid facing even that if I stored my documents and applications in the "My Home" folder, which is accessed via a desktop icon, just like the Windows "My Documents" folder.

Although I installed Linux into its own Linux-formatted disk partition, WordPerfect was still able to read all my documents created with Windows, which were stored on FAT32 partitions.

Round 1 goes to Linux. The surprises, so far, have all been pleasant, and now I can begin to explore this new-to-me operating system with an eye to its usability. (I already know — or at least expect — that it's going to be more stable and crash-proof than any of my current versions of Windows.) I'm looking at Linux not as a server platform but as an end-user client, trying to determine how good it is, how strange or different it is from what Microsoft Windows has accustomed us to and whether there is any reason to consider using it as a desktop operating system in preference to Windows.

My first conclusion is that there's no need for an ordinary user to be afraid of the graphical shells on Linux — or at least not the KDE shell that I tried. I'll try some others in the coming months. But it seems pretty clear that if you can find the application you need, Corel Linux works, and looks, pretty much like Windows.

Should information technology management think about using Linux as a desktop operating system? That's an intriguing question, but I'm going to let it hang in the air for a while.

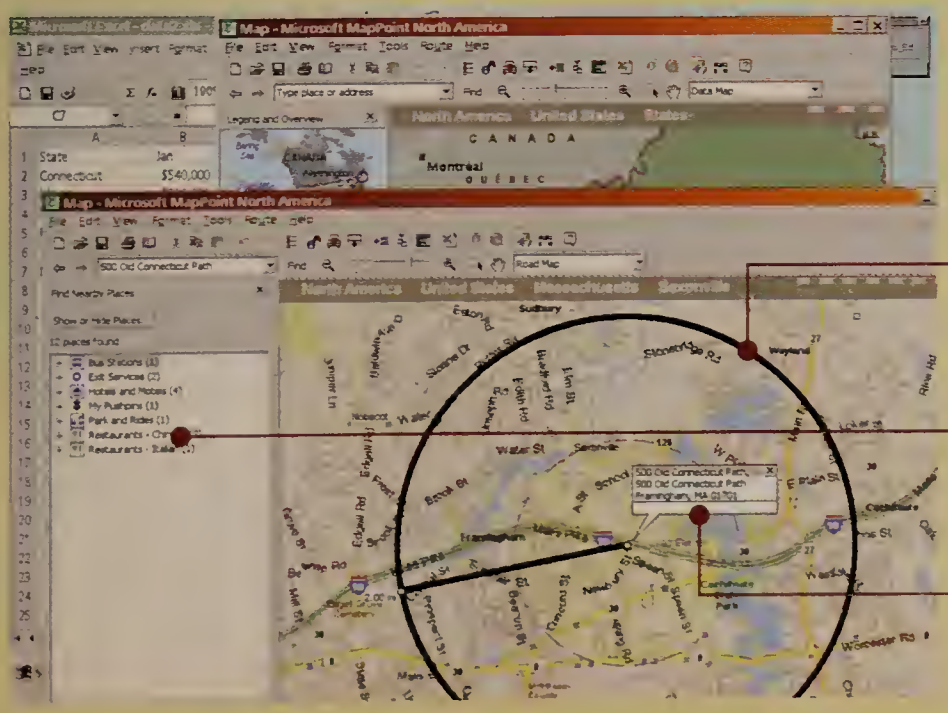
Where Do You Want to Go Today?

Microsoft Corp. keeps asking us that question in its ads, and now it has supplied a first-rate package that can help us answer it. The product is MapPoint 2001, a mapping program that has a lot of intriguing and powerful database capabilities and integrates well with the Microsoft Office suite. In addition to street-level maps of the U.S. and Canada (a European version will be available soon), the program has multisourced demographic and census data, down to individual ZIP codes.

This isn't a full-fledged geographic information system (GIS), but in some ways it's better and easier to use. With MapPoint, you can drag a highlighted area of a spreadsheet — representing, say, sales in various states during a certain period — and drop it onto a map of the U.S. It asks what style of representation you'd like and then creates a map that shows the data graphically. You can also use data directly from Access and Outlook.

You can give MapPoint 2001 a list of addresses and have it plot the most efficient route to travel to all of them — and you can customize the routing to take into account time-of-day travel factors. You can also create customized maps for downloading onto a pocket PC's Pocket Streets program.

I've used GIS applications and several other mapping programs. While they've all been useful and delivered what they promised, I've never found one that was easier to use or one that I like better.



MAPPOINT 2001

Microsoft Corp.
Redmond, Wash.
$249
www.microsoft.com

Cache Memory

BY GARY H. ANTHES

DEFINITION

Cache memory is high-speed random access memory used by a computer processor for temporary storage of information. It boosts performance by keeping the most frequently used data and instructions physically close to the processor, where they can be retrieved more quickly.

CACHE MEMORY is all about speed and efficiency. It's a clever technique to help a computer processor work more smoothly. You can think of memory as being organized a little like your office. Small amounts of frequently used information, such as the departmental phone list, are put on the bulletin board above your desk. Similarly, you keep information on your current projects close at hand. Less frequently used information, say the city phone directory, sits on the bookshelf next to your desk. Rarely used information is in a filing cabinet.

Computers store data using a similar hierarchy. When applications start, data and instructions are moved from the slow hard disk into main memory (dynamic RAM, or DRAM), where the CPU can get them more quickly. DRAM acts as a cache for the disk.

Levels Upon Levels

Although DRAM is faster than the disk, it's still pokey. So data that's needed more often is moved up to the next faster memory, called the Level 2 (L2) cache. This may be located on a separate, high-speed static RAM chip next to the CPU, but new CPUs usually incorporate the L2 cache directly on the processor chip.

At the highest level, the most frequently used information — say, the instructions in a loop which execute repeatedly — is stored directly on a special section of the processor chip, called Level I (L1) cache. This is the fastest memory of all.

Intel Corp.'s Pentium III processor has 32KB of LI cache on the processor chip and either 256KB of L2 on-chip or 512KB of L2 off-chip. The L2 cache on the CPU chip can be accessed four times faster than if it were on a separate chip.

When the processor needs to execute an instruction, it looks first in its own data registers. If the needed data isn't there, it goes to the L1 cache and then to the L2 cache. If the data isn't in any cache, the CPU calls out to the main RAM. It might not even be there, in which case the system has to retrieve it from the disk.

When the CPU finds data in one of its cache locations, it's called a "hit"; failure to find it is a "miss." Every miss introduces a delay, or latency, as the processor tries a slower level. In a well-designed system with software algorithms that prefetch data before it's requested, the hit rate can reach 90%.

For high-end processors, it can take from one to three clock cycles to fetch information from L1, while the CPU waits and does nothing. It takes six to 12 cycles to get data from an L2 on the processor chip, and dozens or even hundreds of cycles for off-CPU L2.

Caches are more important in servers than in desktop PCs because servers have so much traffic between processor and memory generated by client transactions. Intel turned a 50-MHz, 80486-based PC into a server in 1991 by adding a 50-MHz cache to the processor chip. Although the bus connecting processor and memory ran only at 25 MHz, this cache let many programs run entirely within the 486 chip at 50 MHz.

This hierarchical arrangement of memory helps bridge a widening gap between processor speeds, which are increasing at roughly 50% per year, and DRAM access rates, which are climbing at only 5% per year. As this performance mismatch grows, hardware makers will add a third and possibly fourth level of cache memory, says John Shen, a professor of electrical and computer engineering at Carnegie Mellon University in Pittsburgh.

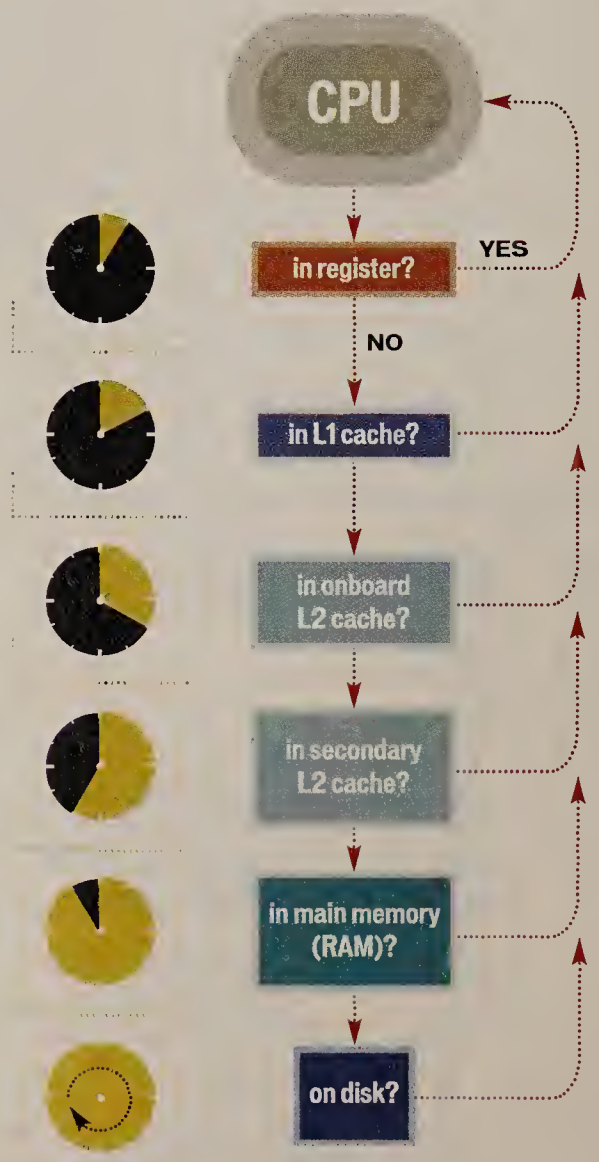
Indeed, later this year, Intel will introduce Level 3 (L3) cache in its 64-bit server processors, called Itanium. The 2MB or 4MB cache will connect to the processor over a bus that runs as fast as the processor — 800 MHz.

IBM is also developing its own L3 cache for 32- and 64-bit Intel-based Netfinity servers. At first, it will be placed on the memory controller chip and will be available toward the end of next year, says Tom Bradicich, director of Netfinity architecture and technology.

IBM's L3 will be a system-level cache available to the server's four to 16 processors. Intel's L3 can help only the processor to which it's attached, but IBM says its L3 can improve throughput for the whole system. Bradicich says IBM's L3 also will aid high-availability computing for e-commerce by enabling main memory swap-outs and upgrades as the system is running.

Where's My Data?

When the CPU needs data, it first looks in its own data registers. If the data isn't there, the CPU looks to see if it's in the nearby Level 1 cache. If that fails, it's off to the Level 2 cache. If it's nowhere in cache, the CPU looks in main memory. Not there? The CPU gets it from disk. All the while, the clock is ticking, and the CPU is sitting there waiting.



Bigger Isn't Necessarily Better

The frequency of cache misses can be reduced by making caches bigger. But big caches draw a lot of power, generate a lot of heat and reduce the yield of good chips in manufacturing, Shen says.

One way around these difficulties may be to move the cache-management logic from hardware to software. "The compiler could potentially analyze program behavior and generate instructions to move data up and down the memory hierarchy," Shen says.

Software-managed caches are currently confined to research labs. Potential obstacles include the need to rewrite compilers and recompile legacy code for every new CPU generation, Shen says.

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COMPAQ ONE YEAR I

The company is stronger after a high-profile CEO change, but it still faces uncertainties, according to users and analysts.

By Matt Hamblen

COMPAQ COMPUTER Corp. has successfully weathered the storms of the past year, but some gray skies still linger for the $40 billion computer giant, according to a new *Computerworld* poll and interviews with users and analysts.

Since the ouster of CEO Eckhard Pfeiffer a year ago and the installation of Michael Capellas as Pfeiffer's replacement last July, Houston-based Compaq has clearly become a stronger company that provides excellent services, PCs and high-end servers, polling results and interviews show.

But users and industry analysts still have questions about Compaq's future. Why can't Compaq's stock price climb above the low $30s? How will it distinguish itself from tough competitors such as Dell Computer Corp. in Round Rock, Texas? High-end users wonder about Compaq's devotion to the Alpha server platform and VMS operating system, adopted after its June 1998 acquisition of Digital Equipment Corp. in Maynard, Mass.

And some users even say that some of Compaq's bright spots, like the new iPaq desktop PC or its move to direct sales, have been dimmed by the company's inability to clearly communicate their value to customers.

These signs of softness were found in last month's *Computerworld* survey, in which 151 current Compaq users were asked which Compaq products they use today in 10 categories and which ones they'll use in 12 months from the same categories. Overall, the number they say they'll use decreased in eight out of 10 categories.

That finding contrasts with a solid 69% who say Compaq understands the needs of enterprise customers, up from 53% in a January 1999 *Computerworld* poll. So while 69% of users surveyed say they have faith in the company, they also indicate that they expect to buy somewhat fewer Compaq products over time.

Shaky Perceptions

"I'm more positive on Compaq's overall prospects than I was a year ago, but I'm not pounding the table on them," says Charles R. Wolf, a financial analyst at UBS Warburg in New York, who rates the Compaq stock a less-than-optimistic Hold.

Uncertainty underscores comments by many users in the poll. "A year from now, I'll probably be just as big a Compaq user as I am now, but I say 'probably' as long as they don't do anything shaky," says Scott Thomas, manager of systems and programming at Alcan Aluminum Corp. in Terre Haute, Ind.

Alcan just purchased three Alpha servers from Compaq and is happy with the products and service for them. But Thomas says he was shocked when Compaq said last August it wouldn't support Windows NT on its Alpha line, and he wonders what that will mean.

"We watch them carefully, and if they [Compaq] trend to extinction, that will affect the prod-

MICHAEL TERRANOVA

> We bought Dell servers last November, even though we were interested in Compaq. We asked for quotes from both, and Dell came in and stomped Compaq.
>
> PAUL KIRK (PICTURED), SENIOR VICE PRESIDENT OF MIS, UNITED COMPANIES FINANCIAL CORP.

ucts we buy," he adds. "I'd like some more backing for the VMS environment and some reassurances. Their product is OK, but the business end of Compaq seems shaky, and customers leave companies for that reason."

Threat From Dell

Some customers say Compaq is also failing to show the moxy of Dell, especially in competing for their business.

"We bought Dell servers last November, even though we were interested in Compaq," says Paul Kirk, senior vice president of MIS at United Companies Financial Corp. in Baton Rouge, La.

"We asked for quotes from both, and Dell came in and stomped Compaq," Kirk says, adding that he didn't understand why Compaq wouldn't compete on price.

Several analysts say Dell sales teams swooped in last year to grab Compaq enterprise business accounts when Compaq was in disarray, but the trend seems to have slowed.

Still, customer satisfaction ratings from September through February were higher for Dell than for Compaq or IBM according to *Computerworld*'s BrandTrack research — a survey of customer loyalty and satisfaction that is sent to thousands of IT buyers each month.

Over the past year, BrandTrack found that more customers planned to stick with their Dell desktops, PC servers and notebooks than did Compaq customers.

Roger Kay, an analyst at International Data Corp. in Framingham, Mass., says IDC's surveys have shown similar softness for Compaq. "In terms of brand loyalty, Dell is clearly above the others," he says.

In reaction, Compaq spokesman Alan Hodel says Compaq still sells more PCs than any vendor, adding that half of Compaq's revenue comes from enterprise servers and services that have nothing to do with PCs. Compaq's report for fourth-quarter 1999 showed $332 million in profits on $10.5 billion in revenue, a decrease of 4% over the same quarter in 1998, but higher than analysts' expectations.

IPaq Innovation

The new iPaq PC, which Compaq started shipping in January, could help in the desktop battle with Dell and other large vendors. The small, stylish iPaq starts at $499 and boasts features that allow easy Universal Serial Bus connections and reduce many desktop variables to help companies lower the total cost of ownership, a major concern of users.

When the iPaq was announced, Compaq said the project took half the normal design-to-production time, a sign to industry observers that Capellas was solidly in charge. The product is being imitated by IBM and Hewlett-Packard Co., but iPaq was the first on the street, and analysts say Compaq can sell $1 billion worth of iPaqs by the end of this year — although several analysts say they've had trouble gauging early sales.

Reviewers raved when the product was released, yet Kay says he suspects it hasn't caught on as fast as Compaq had hoped. "My sense is that sales aren't doing overwhelmingly well because Compaq's not crowing about it anymore," Kay says.

Compaq wouldn't discuss sales or other financial data because of the

Continued on page 66

ATER

COMPAQ ONE YEAR LATER

Continued from page 65

quarterly report silent period required by the Securities and Exchange Commission as a guard against insider trading.

Users widely praised the iPaq concept in interviews, but they were also confused about its functions and its future evolution.

"The iPaq TV commercial is too vague, but it looks like a real small box," which would be an advantage for crowded desks, says Terry Arnold, business systems and support manager at Alliant Energy Corp. in Dubuque, Iowa. Arnold says he wants to hear from Compaq how far the iPaq or another Compaq machine will go down the path toward becoming a true thin client — a desktop device that functions like a terminal on a network.

ARNOLD: Looking for a true thin client from Compaq

Direct Distribution Dilemma

The iPaq is being sold directly to customers as part of Compaq's major initiative to build a direct sales model. It has a goal of 40% of direct sales by year's end, an increase from the current level of about 15%.

A few medium-size businesses say they worry the direct model won't serve their needs, because they aren't able to command Compaq's attention the way the largest customers do.

"We've recently had trouble acquiring [Compaq] products quickly, and if you don't have good turnaround, what's the point of going direct?" says Mark Geery, manager of MIS at Tony's Fine Foods in West Sacramento, Calif.

Geery says his company tried to buy 30 laptops from Compaq but couldn't get them soon enough for reasons that weren't explained. So instead, it bought laptops from San Diego-based Gateway Inc. Moreover, he says he was frustrated when he ordered a Compaq docking station for his own laptop last September but didn't receive it until February.

Compaq didn't comment on the specific case, but a spokesman notes that Capellas has said Compaq will move quickly to advance the direct strategy through the recent acquisition of some assets of Omaha-based InaCom Corp. and creation of the Custom Edge subsidiary. Analysts say Custom Edge can help smooth out wrinkles in the transition affecting customers.

Direct sales will decrease distribution costs at Compaq by as much as 6%, reason enough to make the move, say analysts. Still, some customers question how they'd benefit, especially if they like the value-added reseller (VAR) they already use and know.

Compaq will never go 100% direct, according to analysts, partly because it can't completely shut off relationships with VARs. But Compaq needs the direct sales model "if only to regain the intimacy with customers they've lost," says Kevin Knox, an analyst at Gartner Group Inc. in Stamford, Conn.

"Direct gives customers the opportunity to have one neck to strangle instead of several when there's a problem," adds analyst Lindy Lesperance at Technology Business Research Inc. in Hampton, N.H.

Computerworld's survey shows that a majority of Compaq customers feel that the direct model is important to them. Of 37 respondents who have used it, a large majority say they're satisfied (see chart at right).

The Compaq move to direct sales probably is a reaction to Dell's huge success with direct sales, which was evident in Dell's movement last year into the top spot for PC unit sales in the U.S.

Some of Compaq's customers are less concerned with the Dell threat than with Compaq's possible failure to deliver on the high end, however. Those customers are still distressed by Compaq's inability to fully integrate the personnel and functions of Digital, says Terry Shannon, editor of the "Shannon Knows Compaq" newsletter in Ashland, Mass., and a board member of the Digital Equipment Computer Users Society.

"The Digital integration is structurally in place, somewhere above 80% done, but Compaq should have come this far a year ago," Shannon says.

Even if the integration of the Tandem division and Digital is mostly accomplished, only 40% of the users surveyed say they agree that Compaq is committed to supporting and enhancing technologies from the two companies.

Uncertainties about Compaq's future stem partly from the hypercompetitive market in which seemingly little things take on bigger meaning: whether Capellas visits enough big customers or gives a good speech for investors, or what the stock price did today, for example.

"Compaq has really tough competitors, so it's future isn't just a matter of performing well, it's a matter of performing really well," says UBS Warburg's Wolf. ◗

User Views of Compaq

Computerworld surveyed 151 users of Compaq products about their perceptions of Compaq. Users were also asked which types of products they use now and whether they thought they would be using Compaq products in the same categories 12 months from now. Survey results are summarized below.

DIRECT SALES	
Surveyed users for whom a direct sales model is important	71%
Surveyed users who were satisfied with Compaq's direct sales transactions	83%

	JANUARY 1999	MARCH 2000
COMPAQ IS COMMITTED TO SUPPORTING AND ENHANCING THE TECHNOLOGIES IT ACQUIRED FROM DIGITAL AND TANDEM.		
Agree	57%	40%
Disagree	6%	11%
Neither	24%	34%
Don't know/not answered	13%	15%
COMPAQ HAS THE ENGINEERING SKILLS REQUIRED TO INNOVATE IN THE HIGH-END SERVER SPACE.		
Agree	78%	78%
Disagree	7%	4%
Neither	11%	11%
Don't know/not answered	4%	7%
COMPAQ HAS THE RESEARCH AND DEVELOPMENT SKILLS REQUIRED TO INNOVATE IN THE HIGH-END SERVER SPACE.		
Agree	78%	75%
Disagree	6%	5%
Neither	11%	9%
Don't know/not answered	5%	11%
COMPAQ UNDERSTANDS THE NEEDS OF ENTERPRISE CUSTOMERS.		
Agree	53%	69%
Disagree	14%	12%
Neither	28%	15%
Don't know/not answered	5%	4%

MARKETS	USING COMPAQ PRODUCTS NOW	WILL BE USING COMPAQ PRODUCTS IN 12 MOS.	CHANGE IN PRODUCT USAGE 12 MOS. FROM NOW
Windows NT servers	78%	65%	-16.95%
Desktop PCs	75%	59%	-21.24%
Mobile PCs or laptops	62%	52%	-15.96%
NT workstations	60%	50%	-16.67%
Windows NT/ Windows 2000 support services	17%	19%	7.69%
Network and systems management services	16%	13%	-20.83%
Unix workstations (formerly Digital)	15%	14%	-4.55%
Unix servers (formerly Digital)	15%	14%	-4.55%
Systems integration services	13%	11%	-15.79%
Handheld devices	8%	13%	66.67%

Methodology. From March 3 to 8, *Computerworld* conducted 151 telephone interviews to gather customers' views on Compaq Computer Corp.'s performance for the past year. *Computerworld* selected from its circulation file managers, directors and vice presidents of IT in organizations with 500 or more employees. Respondents of the survey were required to be involved with technology and vendor selection in their organizations. Government and educational institutions were excluded. In addition, the organization had to have been a user of Compaq products or services for at least one year.

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First, we had glass-house mainframes, then distributed workgroup servers. Now we've combined the headaches of both into centrally managed server farms. By Barry Nance

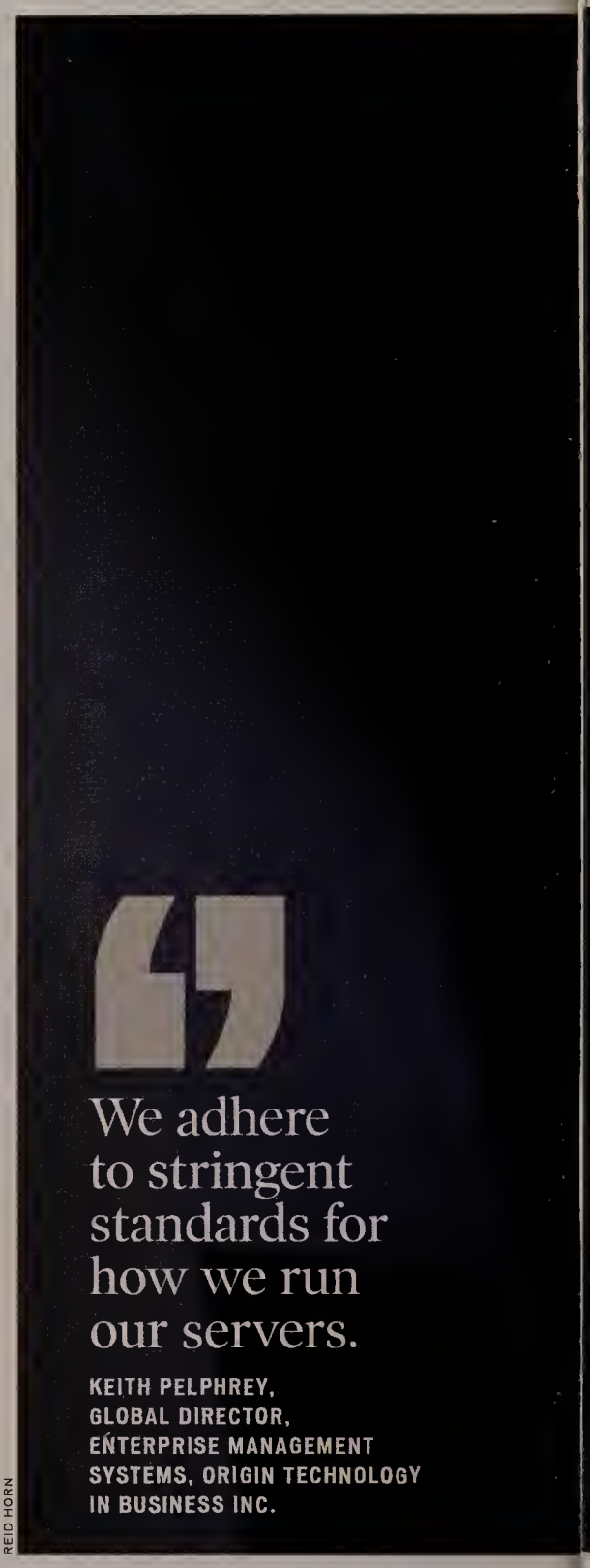
THE PROMISE of client/server computing was to make massive, monolithic data centers obsolete. Unfortunately, as companies distributed workgroup servers — and the management of them — across the organization, they uncovered a pent-up need for both computing power and storage capacity far beyond what anyone had envisioned for small to midrange servers to handle. After a dramatic increase in the number of servers and the corresponding management workload, many enterprises are in the process of reclaiming server management as a centrally administered function. Some have even moved the servers to a central location, but most use network-based tools to remotely administer the many servers.

Companies with centrally managed server farms tend their fields of file, database, Web and application processors using very individual, carefully crafted approaches. These approaches combine a diverse set of commercially available tools with a smattering of custom-programmed workflow automation. The software tools are different and the user interfaces are graphical, but the server administrator's management chores are essentially the same as those that a mainframe administrator performs. The key difference is the greater number of machines that the server administrator has to keep running.

Many companies were generally reluctant to talk about their server farm management techniques and tools, fearing that describing the server environment and management procedures would divulge important internal company structures and competitive business strategies. Fortunately, we located a few IT professionals who were willing to share their server management experiences.

The following profiles explore the experiences that four companies have had with multiple-server management. They show that the right mix of tools and procedures is different for different organizations, but that having the right tools and expertise in using those tools is universally important.

As James Governor, an analyst at Illuminata Inc., said: "As IT tries to keep pace with the exponentially increasing need for computing power, companies that stay on top of the management of that computing power will undoubtedly fare better than those that don't."



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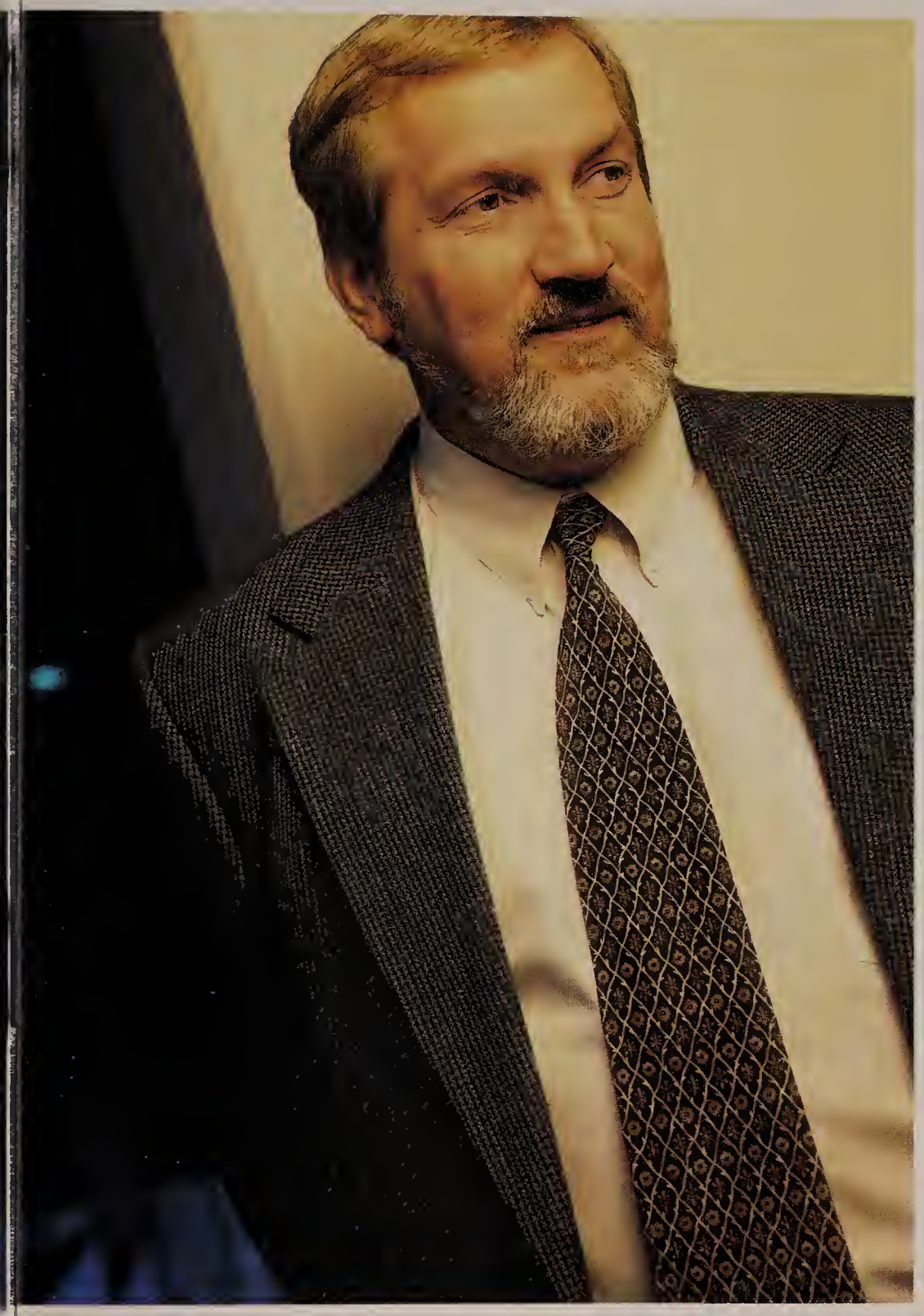

ORIGIN: A PLACE TO START

Organization: Origin Technology in Business Inc. (a subsidiary of Philips Electronics NV) in Dallas, the Netherlands and Singapore
www.origin-it.com
Assignment: Provide global outsourcing services to enterprises
Servers: Many different kinds of Unix and Windows NT servers
Software: Austin, Texas-based Tivoli Systems Inc.'s Enterprise suite of tools
Staff size: More than 60 employees, located at seven sites worldwide
Lead: Keith Pelphrey, global director, Enterprise Management Systems

Origin manages 22 huge server farms for Philips and for hundreds of outsourcing clients with hundreds of thousands of users in 31 countries.

The company's data centers house nearly 60 mainframes and about 3,000 midrange servers. These servers are a mixture of about 1,800 machines, including IBM's AIX and OS/400, Sun Microsystems Inc.'s Solaris, Hewlett-Packard Co.'s HP-UX and Madison, Wis.-based DEC International Inc.'s Unix. There are also about 1,200 machines running Windows NT and NetWare. More than 400 of the computers are Lotus Notes servers; many others are file, print and database servers; and the remainder are application-specific processors for enterprise resource planning and other vertical-market systems.

Global Director Keith Pelphrey and laboratory manager Mark Eimer at Origin's Enterprise Management Systems (EMS) branch explain how they've achieved this remarkable level of efficiency and productivity. "We work hard to make sure the computing environment is consistent and up-to-date, and we adhere to stringent standards — that we created for ourselves — for how we run our servers," Pelphrey says.

Eimer says EMS presents challenges that leave his staff busy. According to Pelphrey, businesses that have trouble maintaining a consistent, standard environment are good candidates for becoming outsourcing customers.

Pelphrey adds that Origin prefers to use Tivoli Systems' Enterprise suite to manage multiple servers, although the company doesn't abandon a customers' existing procedures and tools. To a lesser extent, Origin also uses Unicenter TNG from Computer Associates International Inc. in Islandia, N.Y., and OpenView from HP.

Origin centrally controls the server management software from its mainframe computers, using Origin-written programs. The company also uses IBM's NetView and NetScout Manager Plus to help keep the servers' network connections healthy. For backup and restore functions, Origin uses Tivoli's Storage Manager (formerly ADSM); software from Legato Systems Inc. in Palo Alto, Calif.; ArcServe from Seagate Technology Inc. in Scotts Valley, Calif.; and OmniBack from HP.

Both Pelphrey and Eimer say they empathize with other server farm managers. "People underestimate the complexity of EMS products," Eimer says. "To make an EMS tool do what you want, you need to invest significantly in the training of the people who will live with the tools."

LET YOUR SERVERS DO THE WALKING

Organization: Bell Atlantic Yellow Pages Inc. in Boston
www.bigyellow.com
Assignment: Publish Yellow Pages directories, in print and on the Web

Continued on page 70

the (SERVER) Farm

(SERVER) Farm

Continued from page 69

Servers: Compaq Computer Corp. servers running Windows NT, plus IBM, HP and Sun Microsystems servers running Unix
Software: Compaq Insite Manager; Microsoft Corp.'s Systems Management Server (SMS); Tivoli Expert Advisor; Adkins Resource Inc.'s Hyena; Wise Solutions Inc.'s Wise installer; and Seagate Software ArcServe 6.6
Staff Size: Five
Lead: John Farrer, Windows NT Server manager

Bell Atlantic Corp.'s Yellow Pages subsidiary manages close to 200 servers, scattered from Maine to West Virginia in 50 divisional offices and six data centers. Most of the machines are Compaq Proliant servers running Windows NT, but about 20 run AIX, Solaris and HP-UX. There's also an MVS mainframe in the mix. The servers support about 5,000 end users, all in a single Windows NT domain regulated by one Primary Domain Controller. Microsoft's RAS runs on two servers to provide 150 ports of dial-in connectivity.

The publishing company's mainstay applications are Microsoft Word and Excel productivity tools; Microsoft BackOffice database and connectivity tools; Notes for e-mail; software from PeopleSoft Inc. in Pleasanton, Calif.; QuarkXPress from Quark Inc. in Denver, for page layout; and a custom-written system for processing Yellow Pages advertising orders.

John Farrer says his organization carefully evaluated dozens of applications to come up with the best combination for his team. The group's criteria for server management tools included sophisticated functionality, support for the company's predominant platforms, ease of use and an intuitive interface.

Farrer says he relies on Microsoft SMS for systems management and software distribution. Expert Advisor from Tivoli automates the help desk, while Hyena, from La Vernia, Texas-based Adkins Resource, maintains user identifications, home directories and standard resource-sharing configurations for users. Canton, Mich.-based Wise Solutions Inc.'s Wise installation tool helps Farrer build new Windows NT Server machines that are correctly configured, and Seagate's ArcServe does the backup and restore data protection chores.

Farrer says he firmly believes in staying ahead of hardware failures. For example, each Intel-based server has two RAID disk controllers capable of failing over to the redundant network adapters and power supplies.

Farrer advises other server farm managers to "spend the extra money up front to get fault-resistant, redundant hardware. Buy the best equipment possible. You'll save money over the long term, because the cost of server downtime — such as an unavailable production system — is high. You'll also get longer life cycles with better hardware."

A SPORTING PROPOSITION

Organization: The Forzani Group Ltd. in Calgary, Alberta
www.forzanigroup.com
Assignment: Support the largest retailer of sporting goods in Canada
Servers: Data General Corp.'s DG-UX, with Windows-based clients
Software: HP OpenView; 3Com Corp.'s Transcend; and Intel Corp.'s LanDesk
Staff size: Three
Lead: Michael Flood, IT director

The Forzani Group is Canada's largest sporting goods retailer, with about 300 stores nationwide. The company is growing rapidly and expects to soon have hundreds of geographically dispersed DG-UX servers from Westboro, Mass.-based Data General. About 800 users will access the machines, which will be managed from the company's main office.

The company's principal applications are a sophisticated sales system, a sales data-tracking and trend-analysis system and a business-to-business electronic data interchange system.

Three Forzani Group employees will manage the servers. However, the company says that number could change if some responsibilities are shifted between the help desk and network management teams.

Michael Flood, who's orchestrating the server growth plan, describes it as an offensive strategy to deal with his expanding server farm. He says his goal is to smoothly integrate appropriate new technologies as his group rolls out the servers and management tools.

Flood has identified obstacles he'll need to overcome, such as Canada's geography, time zones and multiple native languages, as well as stores' different operating procedures and server upgrade paths. He says he also wants each store to be as fault-tolerant as possible, insulated from server and network failures.

He's selected OpenView from HP, Transcend from 3Com in Santa Clara, Calif., and LANDesk from Intel as his primary tools. He says he looked briefly at Tivoli's software but found it pricey and unable to handle NetWare-to-Unix migrations. Legato software carries out the backup and restore work.

Flood says his encounters with software vendors have given him a healthy skepticism of salespeople's claims. "Don't believe vendors when they tell you they can automate all management tasks for all servers," he says.

A LITTLE INSURANCE, A LOT OF SUPPORT

Organization: Financial Administrative Services Inc. (a subsidiary of Policy Management Systems Corp.) in Wethersfield, Conn.
www.pmsc.com
Assignment: Administer life insurance products on behalf of major insurance companies
Servers: IBM AIX servers with NetWare and Windows NT; clone machines from Compaq, Dell Computer Corp. and NEC Corp.
Software: Novell Inc.'s NWAdmin; Microsoft User Manager for Domains; Syncsort Inc.'s Backup Express; and Novell's ZENWorks
Staff size: Six
Lead: Scott Wiggin, network manager

Financial Administrative Services is a third-party administrator. The company subcontracts to life insurance companies that want to outsource the customer data maintenance and service functions associated with a particular kind of insurance, such as variable annuity.

The company has only a few dozen servers, accessed by about 700 users. However, there is a strain on the server management team because of the diversity of application environments that Financial Administrative Services has to support as it assumes the identities and workloads of several insurance companies.

> Buy the best equipment possible. You'll save money over the long term.
>
> **JOHN FARRER, WINDOWS NT SERVER MANAGER, BELL ATLANTIC YELLOW PAGES INC.**

On behalf of those companies, Financial Administrative Services runs NetWare; Windows NT; WinFrame, from Citrix Systems Inc. in Fort Lauderdale, Fla.; AIX; and Linux from Red Hat Inc. in Research Triangle Park, N.C. The Linux machines act as file transfer protocol servers, while the NT, WinFrame and AIX servers store customer insurance data and process transactions.

Scott Wiggin says his biggest problem was finding tape backup software that would work with all the company's operating platforms. He decided on Backup Express but then had to get the vendor, Woodcliff Lake, N.J.-based Syncsort, to fix bugs in the product.

Wiggin says he isn't concerned that it takes six people to manage the servers, because much of their time is spent responding to requests to move data between operating environments — a task he hasn't found a way to completely automate.

Wiggin's group uses NWAdmin to administer a NetWare Novell Directory Services (NDS) tree, and Windows NT User Manager for Domains to administer Financial Administrator's two domains. He says he looked at Novell's NDS for NT products and concluded that it isn't capable enough for his group's purposes. Novell's ZENWorks distributes computer programs and data files.

Like Origin's Pelphrey and Eimer, Wiggins says cross-training is essential for keeping servers up and running. ◗

Server Managers vs. Data Center Administrators

Data center administrators and server farm managers perform similar tasks, but there are important differences.

The server manager has to maintain more computers, propagate changes across more machines and deal with multiple operating systems. A data center administrator typically has documented corporate standards for updates, while the server manager's change procedures are often less formal.

A mainframe operating system, such as IBM's MVS, is more sophisticated and mature than the operating systems found on small to midrange servers (although, ironically, Windows NT consumes more memory than MVS). For instance, MVS detects and discards runaway applications and gracefully handles hardware failures and disk-space exhaustion.

A server farm manager's job description may look like his data center counterpart's, but don't be misled. The server farm manager has the tougher job.

– *Barry Nance*

Nance, a software developer and consultant for 29 years, is the author of Introduction to Networking, 4th Edition *(Que, 1997) and* Client/Server LAN Programming *(Que, 1994). Contact him at barryn@erols.com.*

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Special Delivery

Start-up Click2send.com guarantees timely delivery of massive data files

BY CYNTHIA MORGAN

SLOW OVERSEAS connections and a nosy neighbor led Duane Wadsworth straight to Click2send.com Inc., a start-up that's pushing to become the registered mail delivery service of the Internet.

Circuit diagrams are the lingua franca of the semiconductor industry. They're also really, really big and swapped among engineers like your aunt's Christmas fruitcake. That was Wadsworth's problem. His company, Wadsworth-Pacific Manufacturing Associates Inc. in Palo Alto, Calif., brokers manufacturing supplies between North American semiconductor manufacturers and their Japanese suppliers.

Wadsworth's buyers and sellers must see — and alter — product specifications rapidly, and generally send these diagrams as e-mail attachments.

"You can't always guarantee a reliable connection overseas, and some mail programs used in Asia have trouble receiving big attachments," says Wadsworth, the company president. One corrupted attachment, and Wadsworth-Pacific could lose a sale.

There wasn't enough time to express-deliver disks containing large files, he adds. "Federal Express services in Japan are expensive and, with crossing the international dateline, can take three or four days."

Wadsworth says he griped about the situation to a neighbor who happened to work for Click2send.com. The neighbor "nagged" him to try the service.

"He just didn't let up," Wadsworth chuckles. "And now I thank him for it."

One-to-Many Delivery

The idea behind Sunnyvale, Calif.-based Click2send.com's service is simple: Let customers store large data files, such as graphics, large and multimedia presentations once, then download those files for every recipient — and get a receipt to prove the files were successfully delivered.

Senders upload the files to the Click2send.com site only once, no matter how many times they're delivered, which can eliminate a lot of redundant network traffic. Files can be downloaded to authorized recipients as needed, and the sender receives a proof-of-delivery notice. Click2send can convert Windows Media audio and video files to streaming format, enabling the service to provide broadcast presentations.

The firm's delivery mechanisms — which provide reliable, browser-neutral and idiot-proof upload and download capabilities, notification messaging for both sides of the transaction, good security and the ability to automatically delete a file after the delivery period is complete — take a lot of work on the back end. Click2send is still working on incorporating public-key infrastructure security into the system.

Storing lots of large files means massive storage management headaches; Click2send is a poster child for Hopkinton, Mass.-based storage-area network (SAN) giant EMC Corp. The start-up has built a 22-terabyte SAN so far.

"We can scale that in multiples, and we're glad we did [it that way]," says Click2send cofounder David Knight. "We've grown much more rapidly than anyone predicted."

"Click2send has had a lot of positive evolution in the last six months, and their service really does what they promise," says Joyce Graff, an analyst at Gartner Group Inc. in Stamford, Conn. "I think they've set up a good infrastructure, and they're making all the right kinds of relationships."

Free vs. Pay

The company's co-founders, Knight and Charlene Steele Vaughn, have impressive pedigrees, says Graff. Knight helped deliver the very successful Retix and Isocor initial public offerings. Vaughn, who helped found Time Warner Interactive, has been operating in the online entertainment field for several years.

Still, the murkiest part of the Click2send.com picture is the bottom line. Vaughn and Knight have built a tremendous buzz around the service by offering it for free. Registered users get a "lockable safe-deposit box" storage area with a 120MB capacity and a maximum of 50MB for any single file.

Now that the free service has "gone viral" with millions of users, says Vaughn, "it's given us an in to very large corporations that need additional services, probably use high-speed, private [wide-area IP networks] and are willing to pay for it."

The company sells a subscription service for $35 to $50 per seat per month. In return, users get additional storage space, better activity tracking and the ability to collaborate across the Internet.

Analysts at Gartner and Stamford, Conn.-based Meta Group Inc. predict the market for such services will eventually take about one-third of today's global document-delivery business.

For now, Wadsworth is content to use the free service. "It works, and it's free," he shrugs.

CO-FOUNDERS Charlene Steele Vaughn and David Knight hope to draw paying customers from the buzz generated by Click2send.com's free delivery service

Click2send.com Inc.

Location: 1250 Borregas Ave., Sunnyvale, Calif. 94089

Telephone: (408) 752-8400

Web: *www.click2send.com*

The technology: Secure online file delivery

Why it's worth watching: Click2send.com acts as a secure repository and delivery service for data, especially very large files such as multimedia, high-end graphics and presentations.

Company officers: Charlene Steele Vaughn and David Knight, co-founders

Milestones:
- August 1998: Company founded
- April 1999: Free consumer service launched
- March 2000: B-to-B service

Employees: 40

Burn money: Vertex Management, East-West Capital Associates Inc., Angel Investors LP and EMC

Customers: Ogilvy & Mather Worldwide, Wadsworth-Pacific and Mojo Records Corp.

Partners: EMC, Microsoft Corp., VeriSign Inc., US West Inc., Comcast Corp. and Cisco Systems Inc.

Red flags for IT:
- Potential trouble distinguishing itself from competitors.
- Click2send's free service could hurt its business-to-business image. And the success of free-to-pay conversions has been iffy.
- The company's B-to-B offering works best off the public networks, on high-speed private networks that can guarantee performance. While these "private Internets" are increasingly popular, they're not universal – yet.

COMPUTERWORLD emerging companies

[the buzz] STATE OF THE MARKET

Mail Merge

Online file storage and delivery is becoming an Internet sweet spot; many companies are poised to grab market share. Gartner Group analysts say file delivery is becoming a growing industry as corporations turn to high-speed private IP networks to share business-to-business data. Here are three companies to watch for:

Tumbleweed

Tumbleweed Communications Corp., Redwood City, Calif.
www.tumbleweed.com

Tumbleweed's secure business document delivery lacks some of Click2send's collaboration and auditing capabilities. It's using a pay-per-use model that's probably better suited to small or medium-size businesses than large corporations. But its powerful partnerships, including a manufacturer deal that makes its software the message-exchange standard for mail giants like Atlanta-based United Parcel Service of America Inc. and Stamford, Conn.-based Pitney Bowes Inc., definitely give the company room to expand in Click2send's direction.

DocSpace

The DocSpace Co., San Francisco
www.docspace.com

Critical Path Inc., a San Francisco-based messaging provider, has been on a buying spree that includes Remarq, a provider of online collaboration services, and Internet faxing service FaxNet; it closed the acquisition of DocSpace last month. Couple those buys with Critical Path's own secure messaging service, and the company has the potential to become a one-stop shop for virtually all large-scale electronic data delivery. At the moment, those services are still separate, and Critical Path has yet to announce a timetable for a technology merger. When it does, it'll be a powerful offering.

NetVoyage

NetVoyage Corp., Orem, Utah
www.netdocuments.com

NetVoyage's NetDocuments service focuses on storing and working with documents online, instead of on local hard drives. The company has onboard veteran document management builders from SoftSolutions Technology Corp. and so far has transferred much of that hard-won knowledge to its Web service. Like Click2send, the company is offering a free service to bring users into the fold. The firm's offerings so far, however, fall mainly within the consumer and small business sphere. – *Cynthia Morgan*

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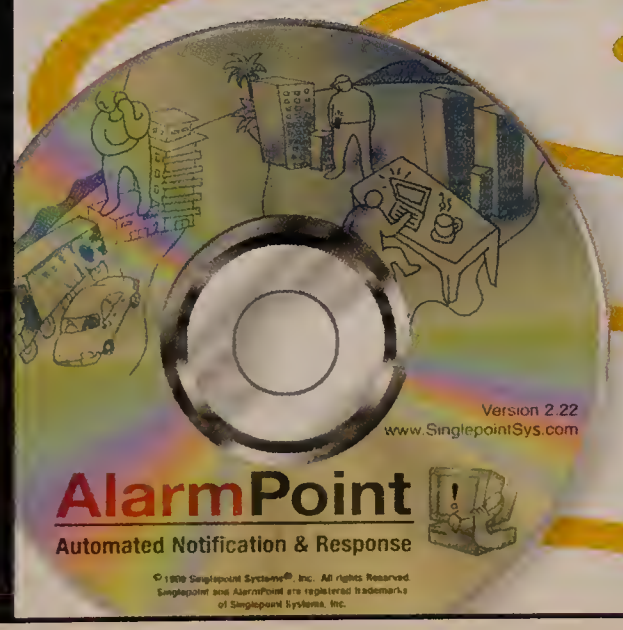

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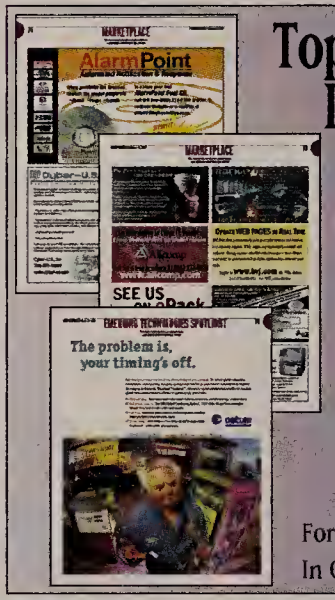

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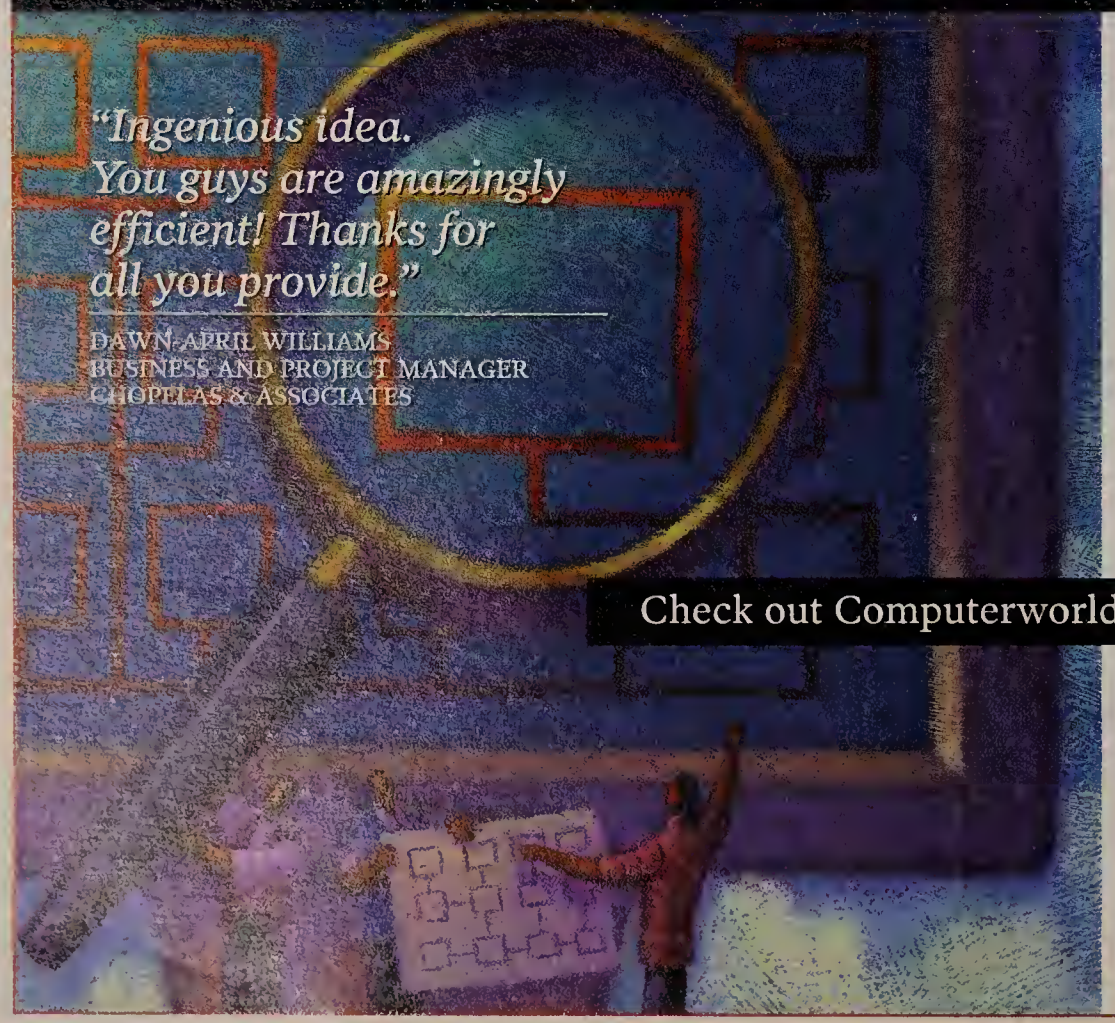

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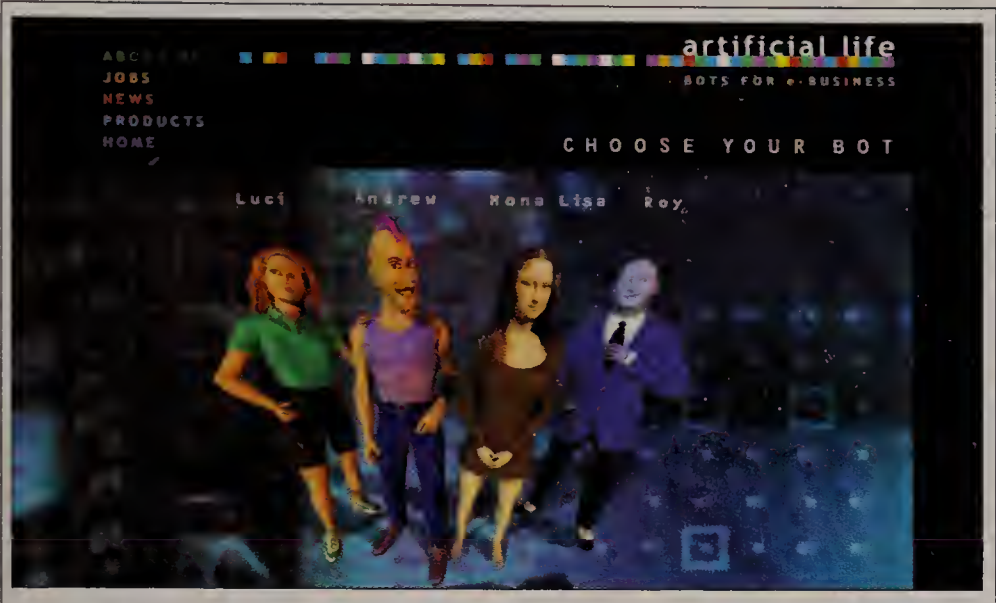

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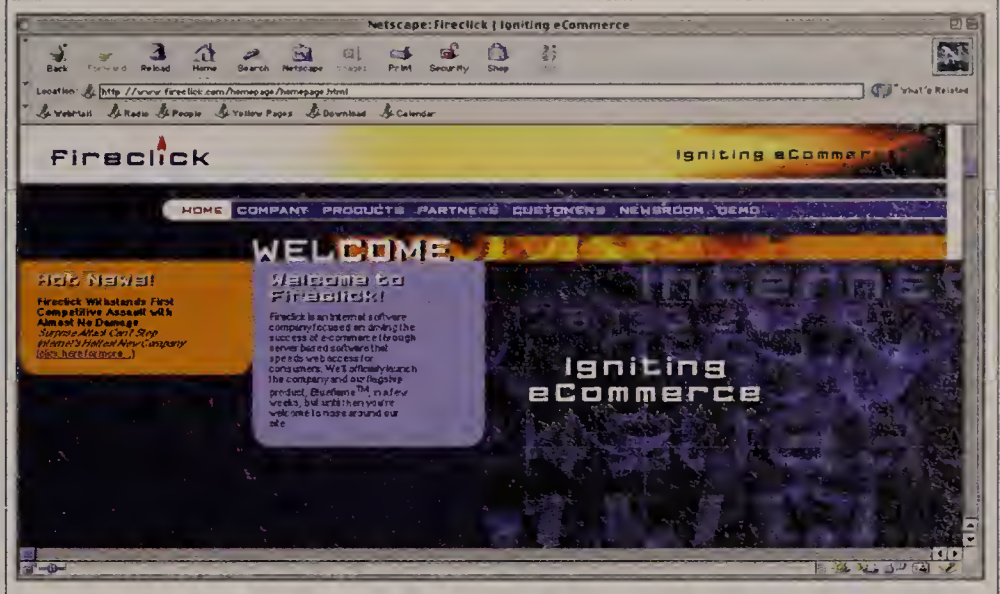

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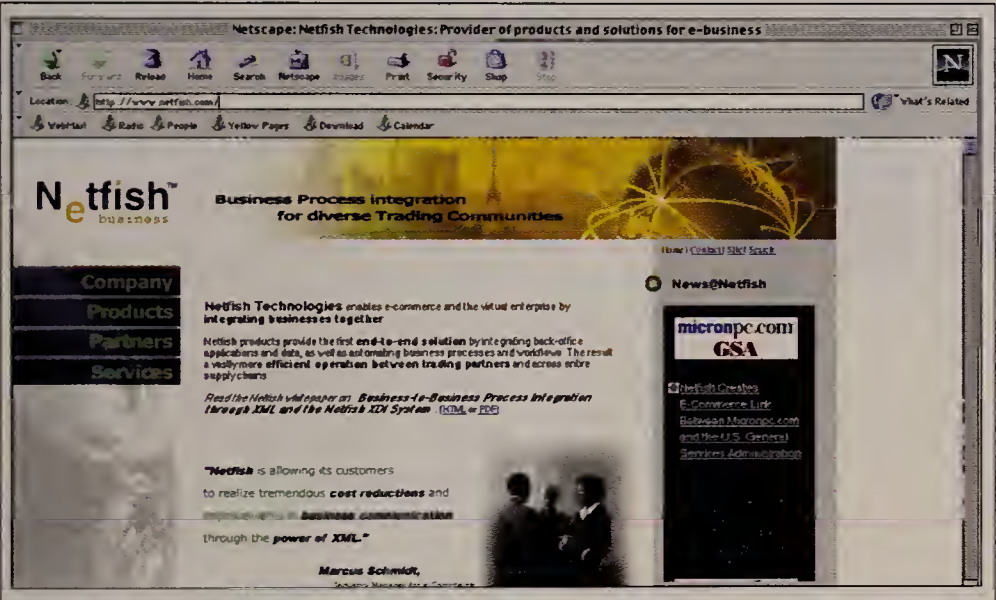

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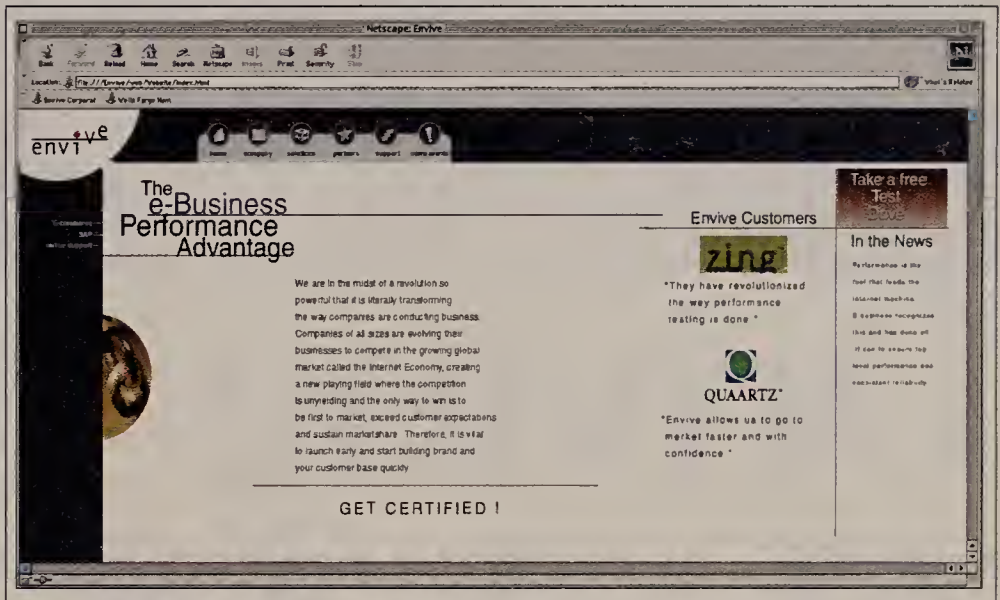

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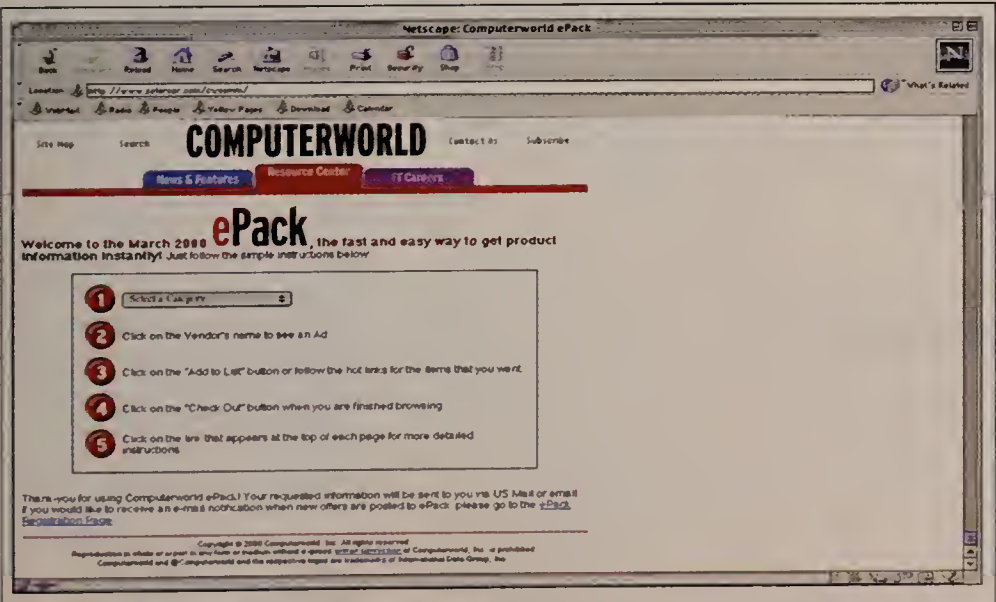

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RUPA JOSHI: E-commerce networking professionals "have to be bold and ready to take decisive actions"

JOHN HARDING

Driving The E-Train

Business-to-business e-commerce is where the hot action is, and e-commerce networking professionals like Commerce One's Rupa Joshi are the folks making it happen. By Bronwyn Fryer

TRILLIONS AND trillions: 2.7 trillion of them, to be exact. That's the number of dollars that the business-to-business e-commerce market will reach by 2004, according to Gartner Group Inc. in Stamford, Conn.

These days, involvement in building business-to-business e-commerce systems is the sweet spot for networking professionals, who have an opportunity to make their mark in ways they've never dreamed of.

One company riding the e-commerce wave is Commerce One Inc. in Pleasanton, Calif., a builder of XML-based products, portals and services for companies wanting to do electronic business together.

Senior e-commerce manager Rupa Joshi's job is to oversee the performance and availability monitoring for Commerce One's hosted sites (BuySite, MarketSite and MarketSite.net).

"The sites have to work in partnership to handle large volumes and other stressful conditions," she says. "My job is to look at performance from an end-to-end perspective and ensure that the systems can handle high concurrency and transaction load through the Internet at peak performance."

Previous experience: Technical director at Charles Schwab & Co., overseeing the performance of the Online Trading System. Joshi also spent several years in performance management of applications, systems and networks at Charlotte, N.C.-based Bank of America Corp.

Impact on company: No high-performance network, no company. "Gone are the days when performance was done after the fact, when something broke down. Now, you have to design everything as a system. An application has to be designed with response time in mind. Huge server farms, with creative load balancing and fault tolerance, negotiate a browser's clicks through a maze of application and database accesses, cached data and network paths. Everything has to work together in partnerships."

Skills needed: A combination of many. Joshi has several years' worth of in-depth experience in performance, availability, capacity and planning, as well as in troubleshooting applications. In addition, she says, "You have to be bold and ready to take decisive actions, be a team player and think big."

Salary, bonuses and perks: "Engineers who understand performance end-to-end are hard to come by," says Joshi. Salaries start at $90,000 and bonuses are at least 10% to 20% of salary. Stock options can be part of the package, too. For Joshi, job satisfaction is an additional perk.

Future opportunities: "Immense," says Joshi. "For somebody doing end-to-end performance, understanding the architecture of the application, network and all systems is crucial. Work like this also gives exposure to production problems, capacity planning, monitoring and network management systems. All this information opens up remarkable opportunities. One can aspire to become a technical director/vice president, CIO or engineering manager. You can be what you want!"

> Have a vision. Think big, and develop a great understanding of . . . systems end-to-end.
>
> RUPA JOSHI, COMMERCE ONE

Challenges, risks and rewards: Keeping up with the pace of technology change and learning as one goes. "I love learning, and if you want to learn, then this is where you want to be," says Joshi.

Advice to others: "Have a vision. Think big, and develop a great understanding of and expertise in systems end-to-end. Be willing to learn and work hard. Be a decision-maker."

Fryer is a freelance writer in Santa Cruz, Calif.

Just the Facts

Name and job title: Rupa Joshi, senior e-commerce manager
Company and location: Commerce One Inc., Pleasanton, Calif.
Nature of her work: End-to-end performance management
How she got the job: Recommended by a Commerce One employee; previous experience
Skills required: Technical, analytical, troubleshooting and tuning
Training needed: Browser and application of HTML, XML, database, network, Internet, network access points, caching, queuing
Salary potential: $90,000 and up, an annual bonus of at least 10%, possibly stock options
Career path: Vice president or CIO. "The world is your oyster."
Advice: "Be a visionary, and learn, learn, learn."

System & Software Test Engineer

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PROJECT MANAGER
to supervise the technical development and implementation of management information systems for various applications using object-oriented programming, C, C++, Oracle RDBMS, Developer 2000 and SQL on mainframe and PC machines in a networked environment; Ensure that goals and objectives of projects are accomplished within prescribed time frame and funding parameters; Establish work plan and staffing for each phase of project; Confer with project staff to outline workplan and to assign duties, responsibilities and scope of authority; Prepare project reports for upper management and clients; Confer with project personnel to provide technical advice and to resolve problems. Require: Master's degree (or equivalent) in Computer Science, Business Administration, or a closely related field, with two year of experience in the job offered or in a related occupation managing software development projects. A Bachelor's degree with an additional five years of progressively responsible work experience in the field will be considered equivalent to the Master's degree. Extensive travel on assignments to various client sites within the U.S. Salary: $80,000 per year, 8 am to 5 pm, M-F. Send resume to: Rao Marupudi, Senior Vice President, Power-Com Technologies, Inc., 1820 Preston Park Blvd., Suite 1600, Piano, TX 75093; Attn: Job RT.

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to analyze, design, develop, test, implement, maintain and support web-based computer applications using Visual Basic, Java, DHTML, Active Server Page and SEQ Server technologies. Require: Master's degree in Computer Science, Engineering, Mathematics, Science, or a closely related field. Must have a demonstrated ability to perform the stated duties gained through previous work experience/academic coursework. Salary: $54,835/year, 8:30 am to 5:15 pm M-F. Send resume to: Elizabeth Haney, Assistant VP, Policy Management Systems Corporation, One P.M.S.C. Center (Int. Of 1-77 & US 21N), Blythewood, SC 29016, Attn: Job XX

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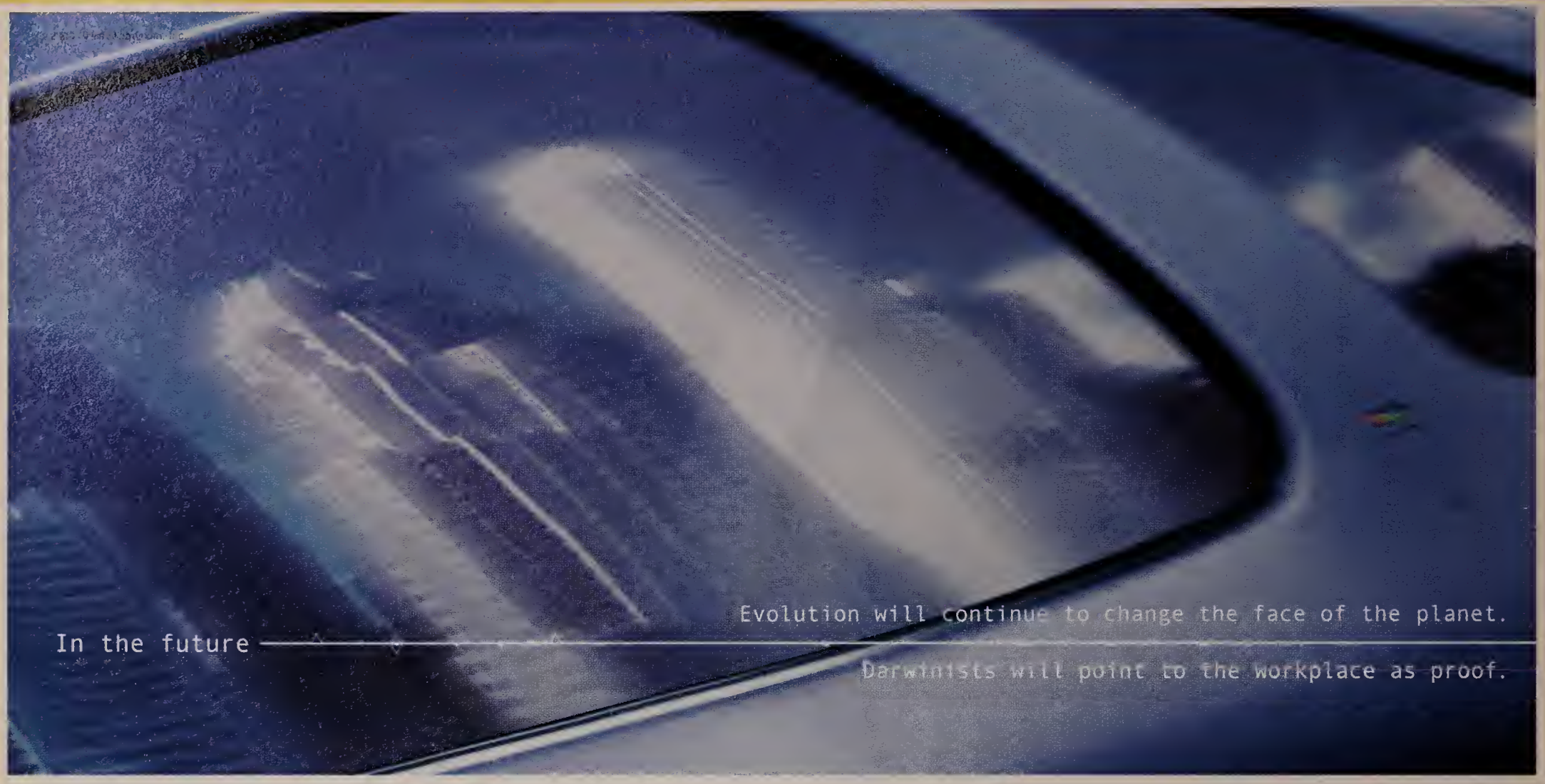

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Vice President of Communication Systems

Directs and coordinates, personally and through subordinate managerial personnel, the requirements definition, design and development of all software communication and networking management system products for on-line, real-time Lottery systems. Communication software products run on multiple hardware platforms including Digital Equipment Corporation Alpha and VAX systems, Intel 486 and 286 processors; and on multiple software platforms including Digital Equipment VMS, Open VMS and UNIX operating systems and Integrated Systems' PSOS real-time operating system kernel.

In conjunction with Marketing and Senior Management, develops a Communication Software Product strategic direction and plan. Develops options and a cost/benefit analysis of each option. Makes recommendations to executive level management. Develops and/or directs the development of requirements statements based on prior knowledge of the on-line Lottery/gaming market needs and interviews with Marketing, Sales, Operations and customers. Identifies new products and deliverables. Creates development plans and directs actual development. Identifies opportunities for incorporation of third-party software products. Directs the evaluation of third-party software products. Negotiates licensing fees with selected third-party vendors. Participates in dialogue with customers on the application of technology in the internationally diverse gaming market.

Manages the operations of the Communication Software Products development group. Plans annual budgets and ensures that actual expenses are within approved budgeted guidelines. Recruits full-time and part-time staff as needed to meet product delivery commitments. Identifies capital equipment needs, evaluates options, initiates purchase and arranges for training as needed. Oversees personnel development. Provides career counseling. Identifies professional growth opportunities for individuals.

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PROGRAMMER/ANALYST: Will conduct and document client interviews to collect detailed facts regarding client business processes and technical environment. Will analyze collected data to model client business systems and prototype new systems solutions. Will participate in system design as well as identify and document issues and risks. Will design develop and implement software and system solutions in client/server environment utilizing a wide variety of operating systems, languages and tools. Requires: M.S. in Computer Science or related field. Must have demonstrated ability in Oracle and Sybase development as well as UNIX and C. Must have demonstrated ability as a PowerBuilder developer. 40 hrs/wk (9 to 5); $9E,000/yr. Send resume/responses to Case No. 19983182, Box 8968, Boston, MA 02114.

Software Engineer (Burlington, MA) Design, develop, debug and test real-time embedded software for a new generation of IP/ATM products. Design and develop network management software for IP/ATM products using conventional and non-conventional protocols. Design, develop and implement various software projects. $76,500/yr, 40hrs/wk, Mon.- Fri. 8:00A.M. - 5:00P.M. REOD: Master of Science degree in Computer Science, Electrical Engineering, or related and one year of experience in job offered or one year of experience as a Firmware Engineer. All candidates must possess hands on experience in C/C++ , IP Routing Protocols, and real-time software development for embedded network systems. Send resume in duplicate to: Case # 19983387, P.0. BOX 8968, Boston, MA 02114

Programmer Analyst sought to analyze, design and program customized software that provides functions specific to state government child support on IBM mainframe using TELON, COBOL, IMS, DB2 and CICS. Design and program software to provide computer-based training and multimedia functions using MULTIMEDIA TOOLBOOK. Applicants must have a Bachelors degree or equivalent in electrical engineering plus two years of experience in the job offered. M-F, 8-5; 40hrs/wk. Salary $33/hr. Submit resume to: Dept. of Labor/Bureau of Workforce Program Support, P O Box 10869. Tallahassee, FL 32302. Re: Job ord# FL-2056570.

Programmer Analyst - Assist client with Payroll System implementation. Design and recommend reporting solutions according to client's business requirements. Assist client with conversion of terminated employees using supported and custom API's. Design and recommend logic to successfully accomplish conversion. Bachelor's or equivalent + 2 yrs exp. in programming w/ Oracle Applications Version 10.6 or higher, Human Resources, Payroll, and General Ledger req'd: Reports 2.0/2.5, Developer 2000 or Designer 2000. Send 2 resumes to Job Order # 2000-102, P.O. Box 989, Concord, NH 03302-0989

SOFTWARE DEVELOPER: Design, Development, Testing and implementation of commercial/ business application systems on a Unix platform; Demonstrated ability using Powerbuilder 5.0/4.0; Demonstrated ability using Oracle 7.0 RDBMS, PI/SOL and MS-Access; Demonstrated ability working on MS-Windows and developing DLL's using Visual C++; Requires: M.S. in Computer Sci, Engg, Math, or related field plus 2 years experience in job offered or software development, will accept BS degree or foreign equivalent degree with five years of experience as computer professional, in lieu of the req'd edu. & exp.; 40 hrs/wk, 8:00 a.m. to 5:00 p.m.; $50,000/yr. Send two (2) copies of resume/respond to: Case #19990797, PO Box 8968, Boston, MA 02114.

Computer - Product Development Manager. $92-97,000. Teaneck, NJ. Position req's a BS in Computer Science or Engineering. A min 7 yrs exp in systems mgmt & 3 yrs in Forte. Skill set incl architecture development of database systems, design of large scale applications & development of fault-tolerant solutions. Responsibilities include managing the development & installation of an integrated toll systems software product, the development & evolution at the technical architecture, providing guidance to the development team & architectural support of deliveries of the finished product. Please fax inquiries to Erin McWilliams at 201-836-4466 or erin.k.mcwilliams@lmco.com. EOE

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Send resume/cover ltr to Attn: Manohar Gadiraju, Gadiraju Technologies, Inc., 138 Ketcham Road, Bellemead, NJ 08502.

Systems Analyst, Malden, MA. Analyze, design, develop and implement software database applications based on Relational database modelling and Client/Server technologies, ORACLE, SQL, Pro*C, Frontend tools -Forms, Reports, Visual Basic and CASE tools in Unix and Windows platforms. Perform database administration and tuning. Req'd. Bachelors in Comp. Scie. or Engg. or Math. 1 yr exp in job offered. 40 hrs/wk., 9a-6p., Mon- Fri., $58,000/Per Year. Applicants should submit two (2) copies of resume in response to Case #19990508, P.O. Box 8968, Boston, MA 02114.

Senior Systems Analyst, Boston, MA; Analyze, design and develop software applications using TMF, TIPC, Rational Rose, Crystal Reports, SCCS and Mks Source Integrity.Perform Oracle DBA using ERWin, Legato Networker and Qualix. Req'd. Masters in Comp.Scie., or Engg., or Math. 1 year exp in job offered or 1 yr exp in a Computer Related Profession. 40 hrs/wk., 9a-6p, $80,000/year.

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Software Engineer (Boston Metro area) Design, develop, implement, and test automated accounting system for a financial institution in C/C++ and UNIX environments. $67,500/yr Mon. -Fri. 9am -5pm. REQD: Masters Degree in Computer Science, engineering, math, management information systems, or related area plus two years exp. in job offered or Bachelors degree in computer science, engineering, math, management information systems, or related area plus five years progressive experience in the job offered.Send 2 copies of resume to P.0. Box 8968, Boston, MA 02114, Case number 19983697

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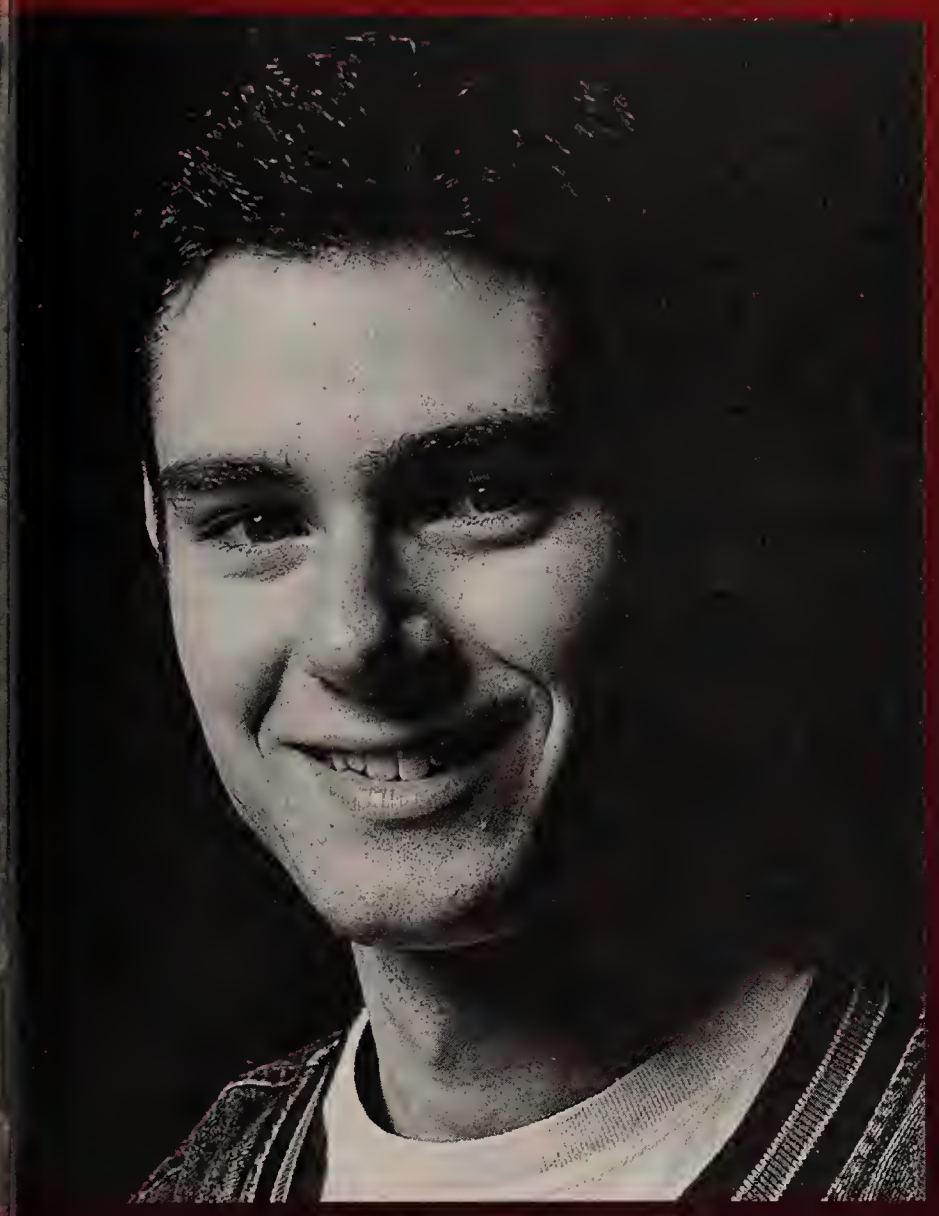

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Senior Software Engineer Positions to design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have 1 year of skills in field. Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or scientific or business related field. Will accept Bachelors degree with five years of progressive experience as computer professional. Salary: $75,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Jaime Lopez, Rapidigm, 4400 Campbells Run Road, Pittsburgh, PA 15205.

RDBMS: DB2, Informix, Oracle, FoxPro, MVS, Novell, UNIX, VAX/VMS, Windows, APT, Crystal Reports, C, C++, COBOL.

Oracle RDBMS: Designer 2000, Developer 2000, Oracle RDBMS, Oracle Applications, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL*Reports.

GUI and Internet Applications: Windows 95, Windows NT, Visual C, Visual C++, C, C++, Visual Basic, PowerBuilder, TCP/IP, HTML, MFC, CGI, MTS.

Mainframe: IBM3090, IBM ES900, MVS, IMS, CL/400, CICS, TSO, VSAM, COBOL, JCL, AS/400.

Embedded Firmware Engineer: Analyzes, designs, implements and tests firmware for global manufacturer of medical diagnostic equipment. Designs and implements embedded system architecture for high bandwidth real-time image acquisition/processing using TMS320C80 parallel-processing Digital Signal Processors. Designs analog and digital test-equipment accessories and hardware involving programmable logic devices and associated software for test automation. Designs network-based diagnostic utilities for field engineers. **Required** is a Master of Science degree in Electrical Engineering and one (1) year of experience in the position being offered or one (1) year of experience in the related occupation of Graduate Research Assistant or Engineer. As part of the required experience in the position being offered or in the related occupation, the applicant must have had experience in the design of real-time system architecture; had experience in using advanced Digital Signal Processors; had experience in using programming languages: C/C++/TMS320C80 specific assembly; and had design experience with programmable logic devices (FPGA, CPLD) using VHDL and schematic entry. **Monday through Friday; 8:00 AM to 5:00 PM; 40 hours per week; $59,181.20 annually. Qualified applicants can suhmit two (2) copies of resume and cover letter to: Mike Brooks File #C101336; DWE-ALC; PO Box 7972; Madison, Wisconsin 53707-7972. Reference File #C101336.**

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RDBMS: DB2, Informix, Oracle, FoxPro, MVS, Novell, UNIX, VAX/VMS, Windows, APT, Crystal Reports, C, C++, COBOL.

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IT Careers *in* E-commerce/E-business

Every use of technology has its day as a star.
For e-commerce, the day has just begun as individual users and businesses see entirely new opportunities still unfolding in the industry.
It's not just a day as a star – it will be more. Much more.

by Carole Hedden

Amazon.com
Seattle, WA

Dot-com companies may be multiplying like bunny rabbits, but Amazon.com continues to hold the position at the front of the pack. It's o place where new things are under way every day, where IT professionals have a chance to sharpen and improve the online experience for millions of users. Amazon.com offers that unique, rich media experience that combines every ongle of technology/customer touch.

Uniquely Amazon.com, the skills being sought include not just technicol capability but olso "folks with personality," soys Neil Rosemon, director of engineering for morketploce systems. "We need people with possion and a sense of humor – thot's importont because we ore working hard."

Aziz Chowdhury, monoger of technical recruiting, odds that the company does need deep technicol expertise for web and opplication development with additional opportunities for those who have HTML, networking, infrastructure and broadband experience.

"We are builders, not assemblers," says Roseman. "We are doing things that hove never been seen before. We believe that we've only seen about 1 to 2 percent of what e-commerce can do. There is no one out there selling what we need at Amazon.com, so we're creoting what will be copied loter by others."

Roseman says the big attraction for a potential employee is the "newness of it all. And because of thot, there is no real guide of what your career will be like, taking you from point A to point B. The promise is that you're not just leorning about new technologies, you're doing it."

Roseman says one of the things that keeps him humble is the constant drive for him to hire people smarter than himself. "You'll work hard, make history, and people will watch out for you. While you're working on some major ground-breaking project, your supervisor is already working on how to help you toke a break when it's over!"

Berbee Information Networks Corporation
Madison, WI

Behind LandsEnd.com – among the first successful e-commerce sites in the Internet's young history – there is a company providing technology expertise to further blur the lines between a traditional retail shop and the online store. By integrating a number of unique personalization tools, visitors of all shapes and sizes ore able to find the perfect drope or color in a pair of chinos – by virtually 'trying on' the retailer's world-famous clothing.

Thot company is Berbee Informotion Networks.

Founded in 1993 with one employee - President and CEO Jim Berbee - Berbee has grown exponentially, and there are plans to double in size again this yeor. Leveraging regional demond for a new network diagnostic tool – the network 'sniffer' – this scrappy company quickly evolved into a top reseller of Cisco Systems ond IBM solutions. Today, Berbee is building on its e-commerce expertise to become a full-service Application Service Provider (ASP), providing server and applications management, integrated services, network security and data warehousing to a diverse client roster thot includes estoblished Fortune 500 brands, as well as dot-com startups.

"We started writing web applications five years ago, when the online community didn't exist much," soys Tom Mish, development manager. "We specialize in the business-to-consumer model because that's where we have the most experience, working with customers such as Woolrich and Londs' End."

Mish says there is no shortage of IT innovation at Berbee, a fact that bodes well for tech-focused employees and solution-driven customers. "We've found that the best way to grow and keep business is to choose customers who are 'up to something'. By doing so, we retain current staff, and are able to attract new people. We moke sure we have customers who are interested in new and intriguing things."

Michelle Scheffler of the People Department says Berbee seeks web developers, Internet architects, and e-business analysts. "Because most of our positions are customer facing, we emphasize communication skills and business experience. And, as with our customers, we're looking for people who ore 'up to something' – who have gone beyond job duties, people who have had an active role in developing their careers ond who find solutions to reol problems."

More than technicol skills, though, Berbee seeks a less-tangible attribute: o good culturol fit. "We continuously strive to preserve our culture," soys Mish. "So we find people who con adapt to change, who have a trock record for reinventing themselves, as well as their skills. "Toword thot end, Berbee offers three weeks of onnual training.

It must be working: Berbee boosts o 94 percent employee retention rate. "We hire people who are doto shorers, formally and informolly," says Scheffler. "It's common to send out o global e-mail inside Berbee, requesting ideas ond experiences to find a solution – and then being inundated with replies. That's the kind of place Berbee is."

Moreover, when it comes to deciding which IT company to work for, culture is a critical factor in Berbee's fovor. "Trust and support of every individual's judgement is a company principle," she says. "Things don't get tied down here by committees and structure for too long before we invoke thot principle.

"Stature and position isn't everything here - rother, it's the ability to do new things and to go as far as your talents will take you," says Scheffler. Hierarchy is a necessary evil of sorts – to the extent that even Jim Berbee works from a cubicle.

CosmoCom
Melville, NY

One of the biggest concerns about e-commerce transactions is the lack of human contact – getting someone to answer your questions or address your concerns in a timely, responsive manner. This is the very need that CosmoCom meets. "CosmoCom was founded to address this issue in the Internet revolution," says Karen Vallone, CosmoCom director of humon resources. "We provide a cost-effective means of bringing the human touch – live customer service – to the web."

The company, founded in 1995, launched with its core product CosmoCall, and in September 1999, introduced CosmoCall Universe. "CosmoCall Universe is truly the essential e-care technology. The system connects e-businesses ond their customers worldwide in multimedia sessions via telephone and the Internet – including voice and video over the Internet – and also monages e-mail and voice mail messages, all in a single unified platform," explains Vollone. "CosmoCall Universe, the only truly unified contact center technology available today, has evolved as both an end-user solution and an Application Service Provider-proven platform for service providers."

CosmoCom customers can install the product by compact disk, make some slight customizations and be up and running within a day. "We have the ability to integrate with customers' other back-office operations, offering added value and ease of use," adds Vallone.

Over the past three months, CosmoCom's staff has grown by 50 percent. "We're in a rapid growth stage," says Vallone. "The majority of positions we offer are in technical support services – people who can help our customers with installation, implementation, integration and technical support. To maintain our leading position in the forefront of live customer service on the Internet, we're continuing to push the web and telephony areas." In oddition, Vallone is looking for people who understand the principles of customer service and can respond enthusiastically.

"There's no question thot technical professionols hove o tremendous selection of employment opportunities," soid Vollone. "At CosmoCom, you'll find on omozing team of people who feel strongly obout the compony. We're working on the world's most exciting technology in terms of multi-media, odvonced intelligent networks ond e-commerce. People here ore honds-on ond creotive."

The Gartner Group
Stamford, CT

The IT spoce is filled with componies reody to provide the monpower, the thinking, the integrotion ond the product. Just o few are dedicoted to research. Among them is Gortner, bosed in Stomford ond providing service to Fortune 1000 companies.

Mario Zorzos, group vice president-worldwide stoffing, is hiring opproximotely 150 ossociotes per month ocross Gortner's business units. "Gortner hos been o troditionol reseorch compony," she soys. "We were greot ot identifying technologies ond trends ond how these would ploy o port in business infrostructure. We were highly successful, and our stock split three times in under two years."

As with most businesses, however, Gortner is reinventing itself for the new millennium. The "think tank" of the IT industry is now targeting every IT professionol os o potentiol morket. "We provide o resource to every professional or executive involved with decision moking, giving them the lotest informotion on technologies, uses, ond copobilities."

To reoch this extended oudience, Gortner recently ocquired Tech Republic, o dot-com operotion thot will ollow Gortner to reoch more thon 400,000 IT professionols.

So how do you hire the IT gurus who serve IT professionols? "We have three strotegic business initiotives," exploins Zorzos. "The first is in developing our own web copobilities. In the post we provided reseorch through written onolysis ond CD-ROMs. We're now utilizing the web not only to serve os on extension of our distribution channel, but olso os the primory meons by which our clients interoct with us." For this unit, Gortner is looking for people with web-development skills who olso understond the informotion delivery industry. "We'll continue to enhance ond improve our web site to toke odvontoge of the lotest technologies, so there will olwoys be o chollenge ond o need for people who like to work with new tools," odds Zorzos.

The second initiative ot Gortner is to re-energize the compony's reseorch to deliver relevont and thought-provoking positions designed to leod business executives through the moze of technology issues they foce. "We're hiring ot oll levels, from new MBAs to high-powered executives who know the power of technology os it opplies to business," she soys.

The third initiotive at Gortner is growing the services orgonizotion, o consulting group thot helps clients opply the technology/business reseorch.

To enoble oll oreos of this evolving business, Gortner is looking for people with interoctive web development experience, for consultonts who understond the breodth ond depth of industry sectors ond who possess extensive technology expertise, ond for reseorch onolysts who con write, present, ond formulote thought-provoking positions bosed on their reseorch findings ond ore then oble to deliver it to the top echelons of the globol morketploce.

The compony distinguishes itself by offering life bolonce, with consultonts troveling only 30 to 40 percent of the time ond ollowing individuols – even in key leodership roles – to work from their chosen locotion. "And, you'll continue to be o leorner because you're discovering and reseorching what the next trends will be ond how to opply them," soys Zorzos.

In addition, Gartner is developing an in-house learning program to assist with critical research and consulting skills. "You'll be in the thick of the lotest technologies, but strengthening critical operational skills is whot we'll be covering in Gortner University. And, after five years, professionals are entitled to a four-week sobbotical in addition to their vocotion. We also offer a variety of projects ond client relationships with the top companies around the world. You'll generally be working directly with CEOs and CIOs. You'll be called upon to provide research ond advice about entire industries ond trends, but you'll also be required to take that conversation down to the details – the octuol configurations of technology and how best to negotiate deals.

"The bottom line is that you'll be among the leoding thinkers in the industry, making o name for yourself os well as for Gartner."

Intershop
San Francisco, CA

Six years ogo, when the term e-business was an "out there" reference to some electronically enabled purchasing system, Intershop opened its doors to offer the first e-commerce software.

"We were there even before the market was ready," soys Ed Callan, vice president of marketing. "We've hod to reinvent the company o couple of times, but we remain at the forefront." In the more recent past, Intershop provided its software for e-business through Application Service Providers, such as Nortel and Mindspring. Intershop products ollowed the ASPs to host e-commerce storefronts for smoll to mid-sized businesses.

However in 1999, the compony turned ogain to its leadership in developing the enobling softwore for e-commerce. Intershop Enfinity, the newest product, hos token the morket by storm, providing an e-commerce copability for the lorgest of componies

"This new product puts us in o new morket, where accounts ore worth multi-millions and the brond nomes are very recognizoble," soys Collon. "The result is thot our hiring hos had to ramp up very aggressively," odds Collan. The company hos offices throughout North America, in Asia (Hong Kong) ond in Europe. "We ore working with Americon ond internotional partners ond we're constontly in the midst of product development – whether entirely new products, next generotion products or product enhancements."

Jeff Leveroni, director of informotion technology, soys hiring is under woy not only in IT ond engineering, but olso in soles, morketing, humon resources ond finonce. "Our greotest challenge is responding to this explosive growth," he exploins. "My key gool for this yeor is finding people who con help us assure ovoilobility ond occessibility to our network, providing the infrostructure Intershop's teom needs to operote in the most effective monner possible." The infrostructure will include development of o web portal.

Leveroni soys the compony is looking for people with core technicol skills, web experience ond Internet experience. "We need people who ore quick starters and who con monage conflicting demonds on their time ond resources. There is olwoys something hoppening. If you're the kind of person who needs to know whot your job will look like o year from now, this moy not be the ploce," he odds.

In Jonuory, the compony held o three-doy Intershop University. "We spent three doys talking obout whot the future of e-commerce will be ond how to communicote thot os broodly os we con," Leveroni reports. "It's on importont messoge and we took the time to moke sure everyone understonds it."

Collon ond Leveroni point to the Intershop environment os the primory plus for employees. "There's o sense of energy," soys Collon. "We're small enough to maintain thot stort-up feel ond where you can moke o difference from doy one. At the some time, we're past the stoge of hoping to get funding to moke payroll.

"We hove the obility to over-chollenge every single member of the Intershop teom," Collon soys. "There ore troining courses, but the most importont thing is your opportunity to work ot the cutting edge every single doy.

"We're ot the white hot center of the hottest morket oround, ond we leod thot morket. It's on incredible ploce to be."

NetworkOil
Houston, TX

In the oil heavy town of Houston, a business called NetworkOil might be mistoken for just another upstart. It's more. John Keost, chief technology officer ond CIO, soys NetworkOil is just seven months old, offering an online morketploce for the petroleum industry.

"This is on industry where relotionships ore investments and phones and faxes are the means of negotiotion," soy Keost. "The NetworkOil morketplace is set up to improve the efficiency of the procurement processes by delivering o dynamic business solution thot supports online vendor/customer relotionship. On the buyer's side, oil ond gos componies will find o greoter number of suppliers to meet their equipment specificotion needs ond enjoy outomoted trocking ond reporting. On the suppliers' side, it allows the sales person to focus on solutions while building or mointoining the relotionship."

Keost soys the entire concept is o good fit for a conservative, frogmented morket. "Our net market oddresses this world of technical ond highly-engineered equipment. We're not tolking about buying poper clips or office supplies – this is mode-to-order, precision equipment for demonding field use," he exploins.

In addition to the online purchosing capability, NetworkOil is offering links between oil companies thot hove surplus equipment ond those who moy need the equipment.

"The company was founded in September, development work begon in October and we are now in our second round of pilot tronsoctions, with just 100 employees," Keost notes. "We plon to hire 200 more people this year. We need good technology project managers, developers, people experienced with Java and object-oriented design. We also need business analysts who will work to enhance our copobilities, ond we'll need infrastructure, architecture experts to integrate our systems and business process expertise to ensure we are able to improve the efficiency of the way business is done."

The company is looking beyond technical experience. "We look for an interesting range of experiences that demonstrate creativity and innovation," Keost says. "And because we are growing so quickly with minimal structure, we need people who can inspire themselves and others. It's on exhiloroting blend of chaos ond creativity."

Keost is aggressive obout training and coreer development and attracts top talent through the lure of pre-IPO stock options. "We need people to be possionate about the technologies we are using and the way we are using them. And becouse we're small, we can offer o broad range of varied opportunities and challenges. A new recruit may sign on as an onolyst, but moy find himself pitching in with HTML. We want our employees to use their every skill ond then expand them even further."

The culture at NetworkOil is a carefully considered combination of techno savvy with oil and gas tradition. "Oil is an industry where people still do business on the basis of a handshake and the booms ond busts have maintained the entrepreneurial spirit," Keast soys. "Adding e-business into the equation intensifies the elements of risk and rewards that made the oil and gas business what it is today."

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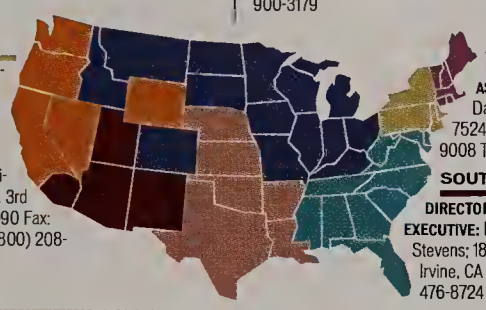

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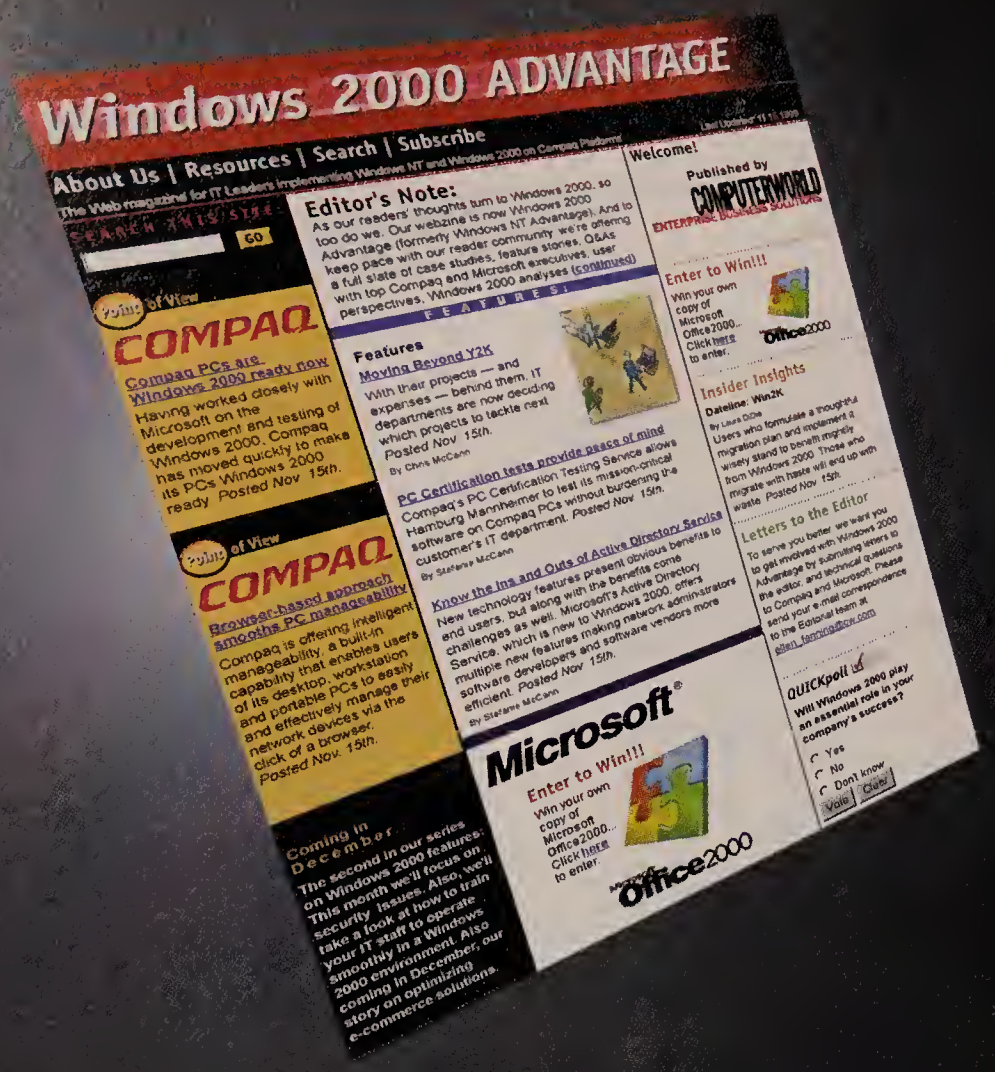

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Advanced Micro Devices	9.5

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Open Market Inc.	-28.4
Open Text Corp.	-27.0
Procom Tech Inc.	-26.6

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HNC Software	-28.69
Quest Software	-27.88
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Security Concerns Boost Vendors' Value

Network Associates, Symantec see stocks rise

BY JULIA KING

INDUSTRY ALMANAC

COMPUTER VIRUSES like Bubble Boy and Melissa, along with a spate of denial-of-service attacks on popular Web sites like those of America Online Inc. [NYSE:AOL] and eBay Inc. [Nasdaq:EBAY], have pushed the issue of security to the front burner at companies worldwide.

They've also helped to raise the stock prices of security software vendors Symantec Corp. [Nasdaq:SYMC] and Network Associates Inc. [Nasdaq:NETA]. Last week, Network Associates' stock hovered around $31 per share, up from the mid-teens last May. Symantec's price, meanwhile, has shot into the $70 range, up from around $20 last May.

Yet in both cases, there's more behind the steady increase in value than users' heightened security concerns.

Analysts cite Symantec's April 1999 appointment of CEO John Thompson — a well-known, experienced executive at IBM [NYSE:IBM] — as another key factor in the company's success.

"He's focusing the company on the corporate and enterprise market as opposed to retail. He's also emphasizing network security, which is very important as companies participate more and more in e-commerce over the Internet," says Rick Davis, an analyst at Richard W. Davis & Co. in Plano, Texas.

Those initiatives, along with Symantec's other big focus on Web site and e-mail filtering software, makes the company "a strong Buy on my list," says Aaron Scott, an analyst at Advest Inc. [NYSE:ADV] in Hartford, Conn.

Analysts are more cautious about Network Associates, which in December spun off McAfee.com Corp. [Nasdaq:MCAF] as a consumer-oriented PC services application service provider. Network Associates still owns between 70% and 80% of the Santa Clara, Calif.-based antivirus software vendor, however.

"We're not pounding the table on [Network Associates'] stock, but we are warming up to it," says Kevin Wagner, an analyst at Adams, Harkness & Hill Inc. in Boston.

One big reason is the McAfee spin-off, which has a market valuation of nearly $2 billion. Another, says Wagner, is "solid fourth-quarter earnings and a lot of new attention to myCIO.com," a Santa Clara-based application service provider that Network Associates launched to offer network-monitoring services.

AT A GLANCE

Safety First

■ SYMANTEC CORP.

Location: Cupertino, Calif.

Key products: Norton Internet Security 2000, Norton AntiVirus 2000

FY 1999 revenue: $634 million

■ NETWORK ASSOCIATES INC.

Location: Santa Clara, Calif.

Key products: McAfee antivirus software, Sniffer network monitoring software, Magic Help Desk software

FY 1999 revenue: $683.6 million

EXCH	52-WEEK	RANGE		MARCH 31 2 PM	WK NET CHANGE	WK PCT CHANGE
SOFTWARE OFF -12.3%						
ASWX	149.12	11.00	Active Software (H)	69.75	-38.25	-35.4
ADBE	116.00	18.84	Adobe Systems Inc. (H)	110.13	1.88	1.7
AR8A	366.68	30.50	Ariba Inc.	203.75	-55.00	-21.3
AZPN	55.37	8.12	Aspen Technology Inc.	39.13	-7.13	-15.4
ADSK	56.06	17.00	Autodesk Inc.	43.13	-7.13	-14.2
AVID	32.37	9 43	Avid Technology	17.63	-3.50	-16.6
BMCS	86.62	30.00	BMC Software Inc.	48.38	-4.56	-8.6
BOBJ	150.87	8.18	Businesss Objects S.A.	99.50	-10.50	-9.5
CDN	27.87	9.18	Cadence Design Systems	19.56	-3.75	-16.1
CBTSY	60.87	8.56	CBT Group Plc.	46.13	-3.88	-7.8
CHKP	295.00	11.50	Checkpoint Software Tech. Ltd.	178.00	-49.25	-21.7
CTXS	122.31	13.25	Citrix Systems Inc.	68.06	-31.88	-31.9
COGN	82.25	19.37	Cognos Inc. (H)	63.25	-17.00	-21.2
CA	79.43	32.12	Computer Associates Int'l Inc.	58.94	-6.69	-10.2
CPWR	40.00	16.37	Compuware Corp.	21.69	-2.50	-10.3
OCTM	106.00	9.37	Documentum	72.31	-7.50	-9.4
EFII	66.37	33.06	Electronics For Imaging	56.44	-8.75	-13.4
HNCS	130.00	13.75	HNC Software	79.38	-28.69	-26.5
HYSL	65.00	9.87	Hyperion Software	32.25	-2.94	-8.3
IOXC	49.12	12.43	IOX Systems	26.75	-3.56	-11.8
INFA	110.87	8.00	Informatica Corp.	93.00	-2.81	-2.9
IFMX	20.96	6.03	Informix Software Inc.	17.13	-2.25	-11.6
INTU	90.00	22.50	Intuit	51.63	-7.63	-12.9
JKHY	40.00	13.21	Jack Henry Associates	36.00	2.06	6.1
JDEC	48.31	10.87	J.D. Edwards & Co.	32.19	-7.44	-18.8
LGTO	82.50	15.06	Legato Systems Inc.	42.75	5.69	15.3
MACR	100.00	27.37	Macromedia Inc.	78.50	-7.63	-8.9
MANU	70.25	5.25	Manugistics Group Inc. (H)	49.75	-15.88	-24.2
MENT	18.50	7.75	Mentor Graphics	15.00	0.00	0.0
MSFT	119.93	73.53	Microsoft Corp.	105.69	-7.25	-6.4
NETA	51.00	10.06	Network Associates	31.38	-4.31	-12.1
GMH	140.00	45.31	Network General	119.50	-12.69	-9.6
NOVL	44.56	16.06	Novell Inc.	27.44	-5.44	-16.5
ORCL	90.00	10.50	Oracle Corp. (H)	79.38	-9.31	-10.5
PMTC	35.93	11.68	Parametric Technology Corp.	20.75	-6.13	-22.8
PSFT	27.75	11.50	PeopleSoft Inc.	18.75	-3.50	-15.7
PIXR	50.62	33.00	Pixar	36.31	-1.19	-3.2
RATL	105.00	21.87	Rational Software Corp.	72.00	-18.13	-20.1
RHAT	151.31	7.00	Red Hat Inc.	41.63	-17.38	-29.4
QSFT	196.25	14.00	Quest Software	115.25	-27.88	-19.5
SAP	85.93	23.75	SAP AG	58.25	-15.94	-21.5
SCUR	29.62	2.25	Secure Computing Corp.	15.88	-5.56	-25.9
SSW	37.50	18.12	Sterling Software Inc.	33.13	-2.50	-7.0
SORC	23.43	8.81	Structural Dynamics Research	13.38	-0.56	-4.0
SYBS	31.00	5.31	Sybase Inc.	21.06	-2.44	-10.4
SYMC	81.62	12.50	Symantec Corp.	74.13	0.25	0.3
SNPS	75.62	36.87	Synopsis	45.75	-3.25	-6.6
SCTC	28.37	7.81	Systems & Computer Technology	21.13	-2.88	-12.0
BAANF	17.81	4.06	The Baan Co. N.V.	5.63	0.59	11.8
TIBX	147.00	5.00	Tibco Software Inc.	88.25	-44.63	-33.6
TSAI	48.12	20.25	Trans. Sys. Arch.	28.81	-0.69	-2.3
VRTS	174.00	13.55	Veritas Software Corp.	141.88	-24.00	-14.5
WIND	66.12	11.25	Wind River Systems Inc.	43.75	-8.38	-16.1
TELECOMMUNICATIONS CARRIERS OFF -0.7%						
AT	91.81	55.87	Alltel Corp.	63.00	-5.63	-8.2
ANDW	31.25	11.00	Andrew Corp.	23.50	-3.75	-13.8
T	63.00	41.50	AT&T	57.44	-0.81	-1.4
BCE	137.50	38.31	BCE Inc. (H)	125.75	-9.25	-6.9
BEL	69.50	47.37	Bell Atlantic	63.00	3.63	6.1
BLS	51.31	34.93	Bell South	47.19	2.00	4.4
BRW	41.06	16.31	Cincinnati Bell Inc.	35.69	-2.19	-5.8
CMCSK	57.68	28.90	Comcast	41.19	1.31	3.3
CQ	37.06	15.37	Comsat Corp.	20.44	3.50	20.7
COX	58.37	32.78	Cox Communications Inc.	45.75	2.38	5.5
GSTRF	53.75	12.62	Globalstar Telecom. Ltd.	14.19	-1.75	-11.0
GTE	78.50	55.81	GTE Corp.	73.50	4.25	6.1
NXTL	165.87	27.43	Nextel Communications	149.50	-8.50	-5.4
SPOT	74.25	26.37	Panamsat	47.44	-10.44	-18.0
QCOM	200.00	8.89	Qualcomm	150.75	3.50	2.4
SBC	59.87	34.81	SBC Communications	42.56	-0.88	-2.0
FON	75.93	40.50	Sprint Corp.	62.63	4.00	6.8
TDS	137.00	50.25	Telephone and Data Systems	109.38	0.88	0.8
USW	81.50	51.50	US West	72.44	4.06	5.9
VIA	63.31	36.68	Viacom	53.63	-4.75	-8.1
WCII	66.50	19.00	Winstar Communications Inc. (H)	59.13	-0.50	-0.8
WCOM	64.51	40.62	MCI Worldcom Inc.	44.63	2.00	4.7
SERVICES OFF -6.3%						
ACXM	35.93	14.56	Acxiom Corp.	31.19	-1.25	-3.9
ACS	53.00	31.00	Affiliated Computer Servs	36.13	-0.06	-0.2
AMSY	44.37	19.75	American Mgt. Systems (H)	39.75	-2.81	-6.6
AUD	55.43	37.37	Automatic Data Processing	48.50	-3.50	-6.7
BSYS	69.00	41.37	Bisys Group Inc.	61.75	-1.75	-2.8
CATP	27.00	10.62	Cambridge Technology Ptnrs	13.38	-1.31	-8.9
CEN	38.06	14.75	Ceridian	19.50	0.19	1.0
CBR	29.81	13.75	Ciber Inc.	20.19	-1.38	-6.4
CDO	57.25	11.25	Comdisco	43.00	-7.88	-15.5
CHRZ	27.12	9.25	Computer Horizons Corp.	16.75	-1.63	-8.8
CSC	94.93	52.37	Computer Sciences	76.75	-3.69	-4.6
DST	76.43	50.93	Dst Systems Inc.	63.63	4.50	7.6
EDS	76.68	45.43	Electronic Data Systems	64 69	-8.81	-12.0
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REY	33.00	17.31	Reynolds & Reynolds	26.63	-0.44	-1.6
SFE	99.00	11.91	Safegard Scientifics	68.94	-22.63	-24.7
SAPE	151.18	23.87	Sapient Corp.	84.06	-13.19	-13.6
SMS	73.50	35.50	Shared Medical Systems	50.25	-12.75	-20.2
SDS	41.93	16.87	Sungard Data Systems	37.94	-0.94	-2.4
SYNT	20.93	7.00	Syntel Inc.	14.50	-1.19	-7.6
TECD	44.68	14.50	Tech Data	33.00	1 69	5 4
TENF	76.87	17.00	TenFold Corp. (H)	60.00	-11.06	-15.6
TSS	21.62	14.12	Total System Services Inc.	15.69	-0.25	1.6
TSAI	48.12	20.25	Transaction Sys. Architects	28.81	-0.69	-2.3
NETWORK OFF -11.1%						
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ADCT	58.93	17.18	ADC Telecommunications Inc.	51.13	-5.50	-9.7
ANTC	61.25	18.62	Antec	43.75	-1.06	2.4
BNYN	40.56	6.25	Banyan Systems Inc.	16.06	-3.25	-16.8
CS	52 75	7.18	Cabletron Systems (H)	29 00	-17 88	-38 1
CNEBF	9.75	2.87	Call Net Enterprises	5.53	0.38	7.3
CSCO	82.00	23.50	Cisco Systems Inc. (H)	76 19	-3 69	-4 6
ECIL	42.25	23.75	ECI Telecom	30.13	-2.50	-7.7
ENTU	150.00	16.87	Entrust Technologies Inc.	81.25	-22 13	-21.4
HRS	40.62	15.50	Harris Corp.	34 19	-3.38	9 0
GMH	140.00	45.31	Hughes Electronics/GM	119 50	-12 69	-9 6
ERICY	105.25	20.50	LM Ericsson	90.81	-11 44	-11 2
JNPR	312 93	11.33	Juniper Networks Inc. (H)	265.50	-9 88	3.8
LU	84 18	48.25	Lucent Technologies	61.31	-3.38	-5.2

EXCH	52-WEEK	RANGE		MARCH 31 2 PM	WK NET CHANGE	WK PCT CHANGE
MADGF	17.37	1.43	Madge Networks	8.38	-3.00	-26.4
NCDI	9.62	3.87	Network Computing Dev	5.16	-0 47	-8 3
NWK	14.81	7.31	Network Equipment Tech.	10.00	-0 63	-5.9
NN	39.50	14.00	Newbridge Networks	32.50	-1 69	-4 9
NOK	233.37	66.53	Nokia Corp. (H)	214.75	-12.00	-5.3
NT	144.18	26.93	Northern Telecom Ltd. (H)	127.19	-14.81	-10 4
PAIR	20.87	7.93	Pairgain Technologies Inc.	18.19	-1.31	-6 7
PCTL	15.21	3 25	Picturetel	9.06	-1.56	-14 7
SFA	77.00	12.25	Scientific Atlanta	62.38	6.13	8.9
TLAB	77.25	37.75	Tellabs Inc.	59.88	-5.63	-8.6
USW	81.50	51.50	US West	72.44	4 06	5.9
VRLK	22.00	1.81	Verilink	11.25	7 75	-40.8
WSTL	40.75	3.81	Westell Technology Inc.	30.81	-6.31	-17 0
SEMICONDUCTORS, CHIPS & EQUIPMENT OFF -8.4%						
ADPT	63.56	19.00	Adaptec	39.13	-8.75	-18.3
AMD	60.00	14.56	Advanced Micro Devices	59.31	5.13	9 5
ALTR	99.25	24.21	Altera	84.31	-10.13	-10 7
ADI	94.68	12.18	Analog Devices (H)	78.38	-12.75	-14 0
AMAT	110.00	24.21	Applied Materials (H)	91.44	-16.00	-14 9
ASML	150.75	36.37	ASM Lithography Holding	108.97	-22.53	-17.1
FCS	44.93	18.50	Fairchild Semiconductor Corp.	36.25	-0 31	-0.9
HRS	40.62	15.50	Harris Corp.	34.19	-3.38	-9.0
INTC	145.37	50.12	Intel Corp.	132.31	-10.38	-7.3
KLAC	91.68	21.18	Kla Instruments (H)	80.88	-8.13	-9.1
LLTC	62.50	20.87	Linear Technology (H)	58.88	6.38	12.1
LSI	90.37	11.93	LSI Logic	70.75	-14.56	-17.1
MXIM	74.50	19.93	Maxim Integrated Products	69.63	-2.88	-4.0
MU	143.12	34.25	Micron Technology (H)	124.50	-14.69	-10.6
MOT	184.62	65.37	Motorola	142.75	-21.88	-13.3
NSM	85.93	8.87	National Semiconductor	59.50	-5.75	-8.8
STM	221.62	40.25	SGS-Thomson Microelectronics	184.19	-15.94	-8.0
SLR	49.00	20.25	Solectron Corp.	39.69	-4.38	-9.9
TER	94.93	21.84	Teradyne (H)	79.69	-10.81	-11.9
TXN	199.56	43.00	Texas Instruments	162.50	-17.25	-9.6
JDSU	153.42	10.68	Uniphase	116.94	-16.56	-12.4
VTSS	115.68	20.37	Vitesse Semiconductor Corp	93.25	-1.50	-1.6
XLNX	88.43	16.43	Xilinx (H)	78.88	-4.88	-5.8
COMPUTER SYSTEMS OFF -7.7%						
AAPL	150.37	32.00	Apple Computer Inc.	130.94	-7.56	-5.5
ASPX	19.00	3.87	Auspex Systems	10.25	-3.13	-23.4
BEOS	39.56	3.28	Be Inc.	15.75	-4.50	-22.2
CPQ	35.43	18.25	Compaq	26.94	-1.56	-5.5
DELL	59.68	31.37	Dell Computer Corp.	54.72	-3.22	-5.6
GTW	84.00	28.37	Gateway 2000 Inc.	52.50	-5.25	-9.1
HWP	155.50	63.37	Hewlett-Packard Co.	134.38	-10.38	-7.2
HIT	164.50	59.93	Hitachi Ltd.	119.88	4.56	4 0
IBM	139.18	81.50	IBM	119.63	-0.25	-0.2
MUEI	20.68	9.00	Micron	13.00	-3.13	-19.4
MOT	184.62	65.37	Motorola	142.75	-21.88	-13.3
NATI	51.75	17.16	National Instruments Corp. (H)	48 31	-1.69	-3.4
NCR	54.56	26.68	NCR	40.31	-3.81	-8.6
NIPNY	149.50	46.62	NEC (H)	147.00	19.31	15.1
PRCM	89.75	3.43	Procom Tech Inc.	44.06	-15.94	-26.6
SGI	18.87	6.87	Silicon Graphics Inc.	10.69	-1.25	-10.5
SNE	314.75	73.12	Sony	278.00	36.00	14.9
SUNW	106.75	23.53	Sun Microsystems (H)	92.81	-7.94	-7.9
TRCD	22.75	1.53	Tricord Systems	9.00	-2.50	-21.7
UIS	49.68	20.93	Unisys	26.50	0.63	2.4
INTERNET OFF -11.7%						
AMZN	113.00	41.00	Amazon.com	64.81	-8.50	-11.6
AOL	95.81	38.46	America Online	65.06	-6.75	-9.4
ATHM	99.00	26.75	@home Corp.	33.13	1.31	4.1
CKFR	125.62	23.12	Checkfree	67.94	5.69	9.1
CYCH	24.00	6.68	Cybercash Inc.	12.19	-1.88	-13.3
EBAY	255.00	70.28	eBay Inc. (H)	185.75	-59.00	-24.1
ETYS	86.00	8.88	eToys Inc. (L)	8.88	-2.31	-20.7
EGRP	72.25	19.18	ETrade Group Inc.	26.50	-3.56	-11.1
LCOS	93.62	26.56	Lycos Inc.	66.13	-2.94	-4.1
OMKT	65.50	11.18	Open Market Inc.	26.13	-10.38	-28.4
OTEX	60.62	9.50	Open Text Corp.	30.31	-11.19	-27.0
PCLN	165.00	16.00	Priceline.com Inc.	77.38	-14.13	-15.4
PRGY	45.87	14.00	Prodigy Communications	14.44	-1.56	-9.8
PSIX	60.93	15.53	PSINet Inc.	34.88	-4.00	-10.3
RSAS	93.06	14.25	Security Dynamics	57.75	-11.34	-16.4
SPYG	95.25	8.62	Spyglass Inc. (H)	71.88	-0.38	-0.5
WINK	75.00	6.00	Wink Communications Inc.	33.50	-3.63	-9.8
YHOO	250.06	55.00	Yahoo Inc.	170.94	-22.19	-11.5
STORAGE & PERIPHERALS OFF -8.5%						
ADPT	63.56	19.00	Adaptec Inc.	39.13	-8 75	-18.3
APCC	44.87	13.09	American Power Conversion (H)	38.25	-1.19	-3.0
CANNY	46.25	21.00	Canon Inc.	43.00	5.13	13.5
DBD	30.68	19.68	Diebold Inc.	26.13	-2 06	-7.3
EK	79.81	53.31	Eastman Kodak Co.	54.81	-2.19	-3 8
EMC	145.43	46.93	EMC (H)	126 13	-14 63	-10.4
IOM	6.37	2.87	Iomega	3.81	-0.19	-4 7
MXTR	14.81	4.25	Maxtor Corp. (H)	11.88	-2.13	-15 2
NTAP	124.00	9.84	Network Applinace Inc.	76.22	-23 97	-23 9
LXK	135.87	42.09	Lexmark International Group Nc.	103.38	-22.19	-17.7
SEG	75.43	25.12	Seagate Technology (H)	65.50	-6.00	-8.4
STK	35.25	11.50	Storage Technology	14.31	0.06	0.4
TEK	71.75	17.56	Tektronix	54 25	-13 69	-20.1
XRX	63.93	19.00	Xerox	26 69	-0 19	-0.7

KEY: **(H)** = New annual high reached in period
(L) = New annual low reached in period

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Aerospace

place is being built on software from Commerce One Inc. in Walnut Creek, Calif. Oracle Corp. is also involved in the auto exchange.

Executives at the companies said their goal is to move as much spending as possible to the exchange to reduce costs. "In short, this will transform the way we do business," said Phil Condit, chairman and CEO of Seattle-based Boeing.

But unresolved issues remain. For starters, the final agreement remains unsigned by the four founders, and some observers question how fast these companies can move.

"There's a contradiction in the personality of the aerospace industry. They've always been associated with technology at the leading edge, but [they're] also extraordinarily conservative," said Craig Schmitman, editor of AeroSpaceNews.com's Leading Edge, an industry news service in Ojai, Calif.

AT A GLANCE

Largest B-to-B Exchange

Partners: Boeing, Raytheon, Lockheed Martin, BAE Systems

Target industry: Aerospace and defense

Total annual sales industrywide: $400B

Partners' combined purchases: $71B/year

Technology platform: Commerce One, Microsoft

Due to launch: Midyear

Only 18 months ago, a significant number of aerospace companies hadn't yet provided their employees with Internet access, Schmitman said.

Aerospace companies "haven't really been on the cutting edge," agreed Richard Aboulafia, an aerospace analyst at Teal Group Corp. in Fairfax, Va. "But efforts like this prove they're headed in the right direction."

A spokesman for Cincinnati-based GE Aircraft Engines, a $10.6 billion manufacturer that supplies about half of all aircraft engines worldwide, said the company has yet to decide how it will participate in an Internet-based industry exchange. Also undecided is whether General Electric Co.'s aircraft unit will participate in more than one exchange, he said.

In February, United Technologies Corp. (UTC) and Honeywell International Inc. announced a joint venture called MyAircraft.com. This week, Lexington, Mass.-based Raytheon will launch EverythingAircraft.com. (see story at top right).

"You're going to see a series of announcements [regarding aircraft and defense exchanges]. Everyone is looking for a value proposition," said Honeywell CIO Bill Sanders. But Sanders also suggested that there could be some consolidation and partnering among the various sites.

For now, GE Aircraft Engines is "talking to Boeing, Lockheed, Honeywell and UTC, but we haven't made the plunge yet," said company spokesman Rick Kennedy.

He added that GE is looking to be more of a supplier than a buyer on any Internet exchange.

"We're already pretty self-sufficient on the buy side," Kennedy said, noting that GE aggregates purchasing across its various units, then procures goods at online auctions it orchestrates itself. In March alone, GE bought $50 million in indirect goods at 12 different online auctions, he said.

Vance Coffman, Lockheed Martin's chairman and CEO, said that at least half of the firm's $13 billion in annual purchasing should eventually go through the new exchange. Bethesda, Md.-based Lockheed Martin is also lobbying officials at the U.S. Department of Defense on the exchange, Coffman said. They have been receptive, he said, "but they clearly want to know more about what this exchange will do."

Commerce One to Port Unix, Oracle

Commerce One Inc. will port its e-commerce products to the Unix operating system and Oracle Corp. database platforms sometime in the second half of the year, according to Commerce One. The products run strictly on Microsoft's Windows NT and 2000 operating systems and SQL Server database.

To date, Microsoft's involvement in recent large business-to-business exchanges has been tied to the success of e-commerce software vendor Commerce One in Walnut Creek, Calif. According to the company's product manager, Kyung Kim, Commerce One's "larger customers" have requested that the company offer more configuration options, and the plan to port is a response to that rather than "a move away from Microsoft."

Analysts and integrators said Commerce One is long overdue for a change of strategy.

– Christine McGeever

Raytheon's Exchange Takes Wing

Continuing its electronic-business roll, Raytheon this week will launch EverythingAircraft.com, an Internet trading exchange for the $5 billion leisure aircraft market.

The site will initially target business users by aggregating data and brokering deals among parts suppliers and service providers. Three months from now, the plan is to extend the site's appeal to a wide audience of consumers, ranging from model airplane hobbyists to aircraft owners.

"It's for anyone fascinated with airplanes and flight," said Eric Singleton, Raytheon's director of global electronic business.

Singleton said EverythingAircraft.com was in development before Raytheon's partnership with Boeing, Lockheed and BAE Systems was formed.

"Raytheon is working on how to include EverthingAircraft.com in the multipartner, independent exchange announced last Tuesday," he said. In the meantime, "we want to move rapidly and capture this market now."

Raytheon, a $20 billion aerospace and defense giant best known as a maker of cruise missiles and fighter-jet radar devices, also owns Raytheon Aircraft Co., a $2.5 billion Wichita, Kan.-based maker of airplanes, including the Beech, Hawker and Bonanza lines.

The company, which also makes radar devices for boats, recently launched a Web site geared toward both businesses and consumers in the leisure-boating market. "The whole Raytheon e-business strategy is to take advantage of its brand strength in known and unknown areas," Singleton said.

– Julia King

Energy B-to-B Starts Off With 15 Utilities

Touts expected industrywide online savings for proposals, quotes, equipment

BY MATT HAMBLEN

FIFTEEN of the nation's largest electric and gas companies have formed a consortium to build an Internet business exchange with suppliers.

The consortium expects to announce the formation of an independent company in June, which will be followed by the creation of the business-to-business online marketplace by year's end, according to statements made by members last week.

The yet-unnamed, for-profit exchange will be open for use by any firm in the energy and utilities industry, but the independent company will initially be owned by the founding utilities, members said.

"It's quite remarkable, really, that 15 companies in the utility space, with competition catching on, could get together and do this in two weeks," said Jennifer Gordon, an information technology spokeswoman for Unicom Corp. in Chicago, one of the 15 members.

"Utilities are not known as being as technologically innovative as a lot of industries, but with automobile and retailing groups creating business-to-business markets on the Web, it's a logical step for utilities to move in this direction," Gordon added.

Another member of the consortium, Public Service Enterprise Group in Newark, N.J., anticipates that it will be able to make up to half its annual nonenergy purchases, which total nearly $1 billion, via the online market within the next three years, spokesman Paul Rosengren said.

According to Forrester Research Inc. in Cambridge, Mass., the utility industry is already the third largest in terms of total online business trade. The consortium expects to generate significant benefits for purchasers and suppliers alike by streamlining purchasing processes, shortening purchase cycles and increasing accessibility between buyers and sellers, the members said.

Initial services will include online proposals, price quotes and auctions for everything from wires to turbines to repair services, Gordon said. Energy itself won't be bought or sold, although several of the utilities are already engaging in such online pursuits separately.

PricewaterhouseCoopers in New York will assist in the development of the exchange and the selection of the technology provider, according to consortium members.

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FRANK HAYES/FRANKLY SPEAKING

Out of left field

IT'S NOT GOING well for the Microsoft and Justice Department negotiators in Chicago. Sources close to Wrigley Field say Judge Richard Posner, who is serving as mediator for the talks, wants to wrap up a settlement in time to attend the Cubs' home opener on April 10. But the settlements proposed so far — leaked to Frankly Speaking by a source known only as Deep Left Field — show the two sides are still far apart.

Microsoft proposal: Microsoft to release the source code for MS-DOS versions 1.0 through 2.25, Microsoft Basic for the Apple II and the original Windows Solitaire game. Justice Department to use Microsoft Office for drafting all future antitrust actions against Microsoft. Rejected after Joel Klein sees the animated paper clip in Office.

Justice proposal: Microsoft to break itself into three companies, to be headed by Scott McNealy, Larry Ellison and Steve Jobs. Rejected because Gates and Ballmer claim they can't remember who Ellison is.

Microsoft proposal: Microsoft to let hardware vendors display a message on the opening screen of Windows 2000: "Warning: The Attorney General has determined that Microsoft may be hazardous to competition." Withdrawn when Microsoft hears that a similar warning didn't protect cigarette makers.

Justice proposal: Microsoft to move its headquarters to D.C., "where we can keep an eye on things." Rejected when a quick check of the phone book verifies there aren't enough Starbucks locations in D.C. to handle one Microsoft product division, much less the whole company.

Microsoft proposal: Microsoft to hire Joel Klein as vice president of industry relations. Rejected because Klein doesn't want to lose his government pension.

Justice proposal: Microsoft to break itself into three companies focusing on software, keyboards and mice. Rejected by Microsoft, which insists the keyboard is fully integrated into Windows 2000 and can't be separated from it.

Microsoft proposal: U.S. to declare Microsoft a sovereign state, and Microsoft to grant U.S. most-favored-nation trading status and a 20% discount on all government purchases. Rejected when Microsoft won't go to a 50% discount.

Justice proposal: Microsoft to break itself into three companies, each of which will receive one-third of the source code for each Microsoft product. Rejected by Microsoft, which admits it can't find the source code for most of its .DLLs anyway.

Microsoft proposal: Microsoft to certify it holds no stock in Parker Brothers, makers of Monopoly. Rejected by Joel Klein, saying Microsoft "seems unclear on the concept of monopoly power."

Justice proposal: Microsoft to break itself into three companies, each of which will release products at random intervals unrelated to their announced ship dates. Withdrawn when Posner points out this will involve no change in Microsoft's behavior.

Microsoft proposal: Gates to make large investments in IBM, AT&T and Standard Oil in order to revive Justice Department antitrust actions against those companies and distract Justice from Microsoft. Rejected by Justice as really, *really* unclear on the concept.

Justice proposal: Microsoft to break itself into three identical and competing companies, each headed by Gates and Ballmer. Rejected because the Microsoft MS-Clone technology is officially scheduled for release this month, so the clones may not actually ship for years.

Microsoft proposal: Microsoft to launch a hostile takeover of the Justice Department, buying all shares at three times market value. If the takeover fails, Microsoft to announce its own Justice Department product and register the name "Antitrust" as a Microsoft trademark. Rejected by Posner as unlikely to satisfy the state attorneys general.

And so the negotiations go on . . .

Can the DOJ and Microsoft settle by opening day?

Hayes, Computerworld's *staff columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.*

SHARK TANK

A BIG FINANCIAL information outfit just sent a long memo to the IT troops. We "must find ways to become more nimble and flexible," says the CIO. Translation: To cut costs, software development and application maintenance are going offshore. The memo promises "new opportunities" for those who can hack it as business analysts, project leaders and QA types; everybody else is on the street. But wait, don't go away mad, the CIO says. In fact, before the outsourcers take over, "consider them as members of our team and give them your full cooperation" while they're analyzing this IT operation. Right. As one pilot fish put it, "Would you train your replacement in order to get laid off?"

ANOTHER HEART-WARMER Friday afternoon. Pilot fish's wife is in the hospital. He gets a call: They can barely find a pulse, and she's being wheeled into emergency surgery for internal bleeding. He e-mails the situation to the boss and races to the hospital. Over the weekend he finally checks his messages. Including the one from the boss, which begins: "I assume that you will make up the time . . ."

PILOT FISH CHECKS Oracle's Web site looking for the answer to a database security question. Clicks on a document link and is asked to log in. Sure, accounts are free, but fish doesn't want to bother. So he tries "the oldest trick in the book," he says. "Name: administrator. Password: password. Success!"

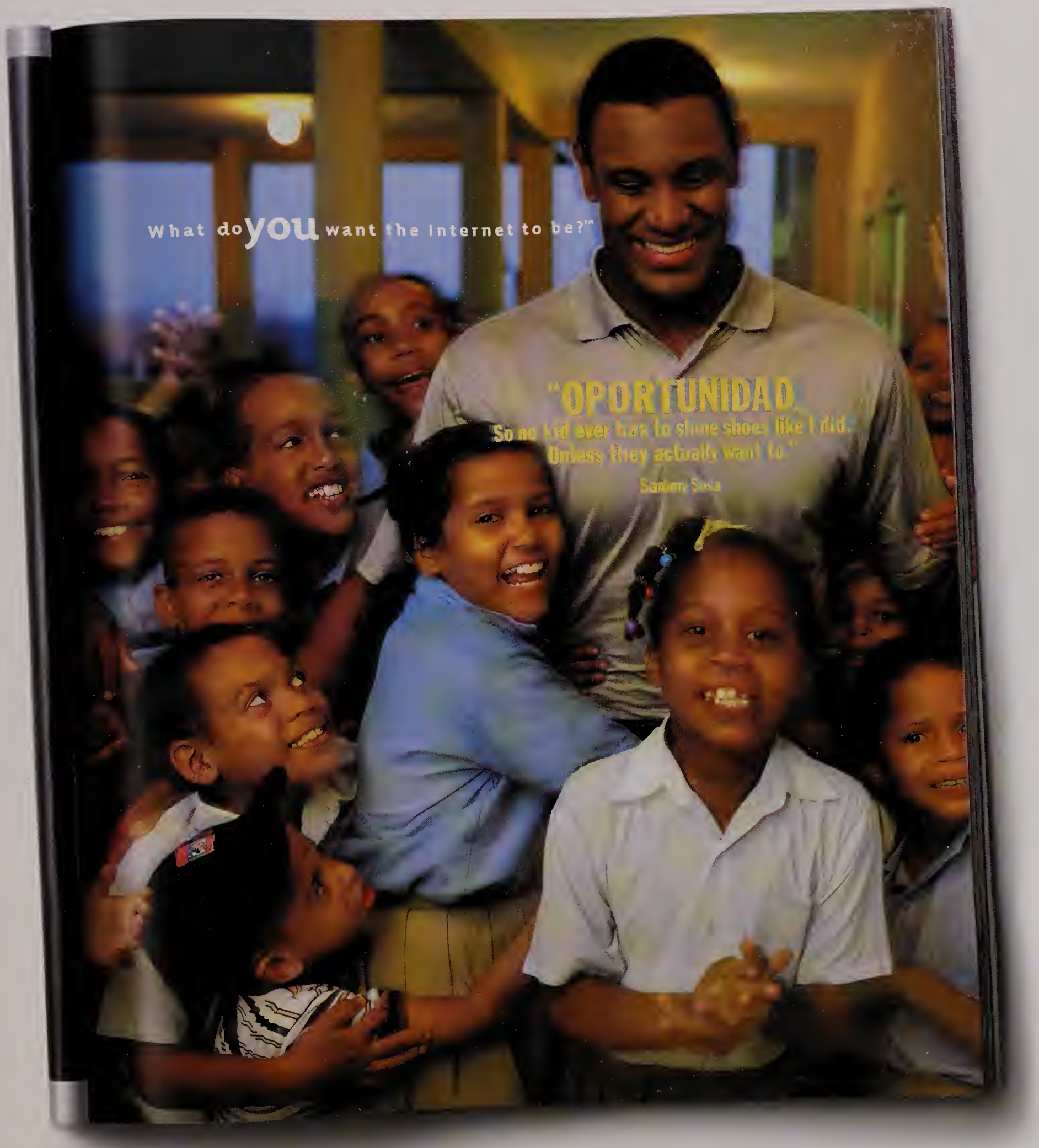
Y2K-PLUS-13-WEEKS A sharp-eyed pilot fish noticed an announcement that showed up in February on the European Commission's U.K. Web site (*www.cec.org.uk/offices/emea1.htm*) that was supposedly posted "29 February 1999" and refers to an agency "established in January 1005."

DEPT. OF CORRECTIONS A whole school of pilot fish wrote in to say a cookie set to 1969 is a feature, not a bug. "The way to kill a cookie is to set its expiration date to the past," as one smarter-than-Sharky pilot fish explained. "The machine on which it resides will then eventually delete the cookie, but there's almost always a lag. This is the way it's supposed to work."

Sharky may not know cookies, but he's got a fin down on Wisconsin over Florida in the NCAA final. Take your shot: **sharky@computerworld.com**. If it prints, you score a T-shirt. And get the daily dunk at *computerworld.com/sharky.*

The 5th Wave

'Well, well! Guess who just lost 9 pixels?"



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